



| Order Instituting Rulemaking Regarding Policies,<br>Procedures and Rules for Development of<br>Distribution Resources Plans Pursuant to Public<br>Utilities Code Section 769. | 04:59 PM<br>Rulemaking 14-08-013<br>(Filed August 14, 2014)       |
|---|---|
| And Related Matters   | Application 15-07-002 Application 15-07-003 Application 15-07-006 |
| (NOT CONSOI   | LIDATED)  |
| In the Matter of the Application of PacifiCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.                            | Application 15-07-005<br>(Filed July 1, 2015)                     |
| And Related Matters   | Application 15-07-007<br>Application 15-07-008                    |

# RESUBMITTAL OF 2021 GRID NEEDS ASSESSMENT AND DISTRIBUTION DEFERRAL OPPORTUNITY REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E)

### **PUBLIC VERSION**

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## BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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On August 16, 2021, as supplemented with an addendum submitted on August 25, 2021, San Diego Gas & Electric Company ("SDG&E") submitted its 2021 Grid Needs Assessment and Distribution Deferral Opportunity Report (together, the "2021 GNA/DDOR"), pursuant to the Commission's Decision on Track 3 Policy Issues, Sub-Track 1 (Growth Scenarios) and Sub-Track 3 (Distribution Investment and Deferral Process), Decision 18-02-004. SDG&E concurrently filed a motion to submit under seal unredacted versions of those materials. Following discussions with Energy Division Staff, SDG&E respectfully resubmits its 2021 GNA/DDOR and a revised, more narrowly tailored accompanying motion.

Respectfully submitted,

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### 2021 Grid Needs Assessment Report of San Diego Gas & Electric Company





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### Purpose

San Diego Gas and Electric (SDG&E) hereby submits its 2021 Grids Needs Assessment (GNA) report in compliance with Ordering Paragraph (OP) 2.d of Decision (D.)18-02-004 (Decision), the Administrative Law Judge's Ruling issued May 7, 2019 (May 2019 Ruling), the Administrative Law Judge's Ruling issued May 11, 2020 (May 2020 Ruling), revised Attachment A provided by the ALJ on June 12, 2020 with further revisions on August 11, 2020, and the Administrative Law Judge's Ruling issued June 21, 2021.

### Background

On February 15, 2018, the California Public Utilities Commission (Commission or CPUC) issued D.18-02-004 on Track 3 Policy Issues, Sub-track 1 on Growth Scenarios and Sub-track 3 on Distribution Investment Deferral Framework. This Decision directed the Investor-Owned Utilities (IOUs or utilities) to file a Grid Needs Assessment (GNA) by June 1 of each year, and a Distribution Deferral Opportunity Report (DDOR) by September 1 of each year. A subsequent May 2019 Ruling directed the IOUs to provide additional GNA/DDOR reporting requirements and moved the annual filing date for the GNA and DDOR to August 15<sup>th</sup>. <sup>2,3</sup>

The GNA report is intended to provide stakeholders with an overview of grid needs that arise from the IOU's distribution planning process, as those needs relate to the four distribution services the Commission approved as deferrable by a Distributed Energy Resource (DER). For the GNA, the May 2019 Ruling requires the GNA report to include forecast loading levels for all distribution circuits and substation transformer banks, regardless of whether there are projected grid deficiencies on that specific equipment. The May 2019 Ruling also requires that each IOU's GNA report include a narrative describing that IOU's process to disaggregate the system-level DER forecast values provided by the California Energy Commission down to the circuit level.

The May 2020 Ruling and the revised Attachment A direct the IOUs to include additional distribution information in the GNA. Some of this information may be developed outside the standard distribution planning process.

### **Executive Summary**

SDG&E's 2021 GNA and DDOR for the 2021-2025 five-year distribution planning period provide an overview of nineteen (19) projected grid needs. These projects have the following in-service years: 2021: 0 projects, 2022: 17 projects, 2023: 0 projects, 2024: 0 projects, 2025: 2 projects.

Decision, at OP 2.d.

<sup>&</sup>lt;sup>2</sup> R.14-08-013 Order Instituting Rulemaking to Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769, at 9.

<sup>3</sup> Some of the additional reporting requirements are specific to the 2019 or 2020 GNA and DDOR.

### 1. Distribution Planning Process

The distribution planning process follows the activities originally described in the Decision, which outlines the existing utility distribution planning process with new additional DER disaggregation requirements. Although the milestone dates and cycle times vary by utility, the general process is sufficient to describe the typical sequence of events and scope. Figure 1 illustrates the revised steps comprising the Distribution Resources Planning cycle, as discussed in the Decision and the May 2019 Ruling.

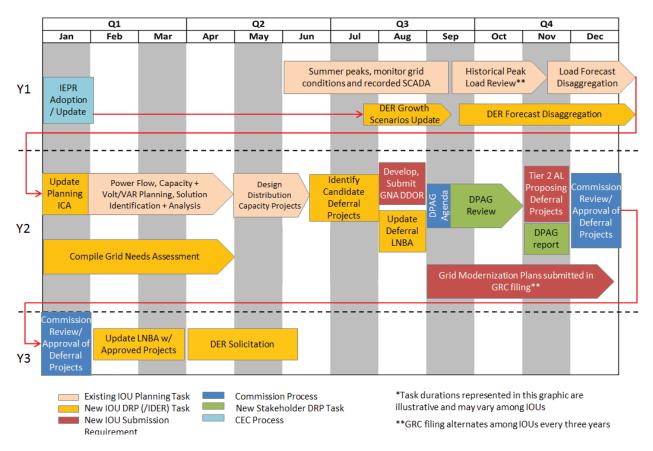


Figure 1 – Distribution Resource Planning Cycle

As shown above, the distribution planning process typically begins with assessing the Historical Peak Load Review for circuits and banks, to establish a reference point for future forecast projections. Concurrently, various system information is captured that is necessary to disaggregate the California Energy Commission (CEC's) system-level projections of load and DER additions to the individual circuit level. Once the actual peak loads and timestamps have been determined for circuits and substation transformer banks, the historical peak is evaluated considering factors such as anticipated new load additions, load transfers, loss of a generator, weather conditions at the time of the historical peak, etc. These factors may result in adjustments to the forecast circuit and bank loading.

A third-party proprietary software forecast toolset, LoadSEER, from Integral Analytics, Inc., is used to incorporate the disaggregated CEC forecast load and DER additions to the circuit level and to include adjustments based on the factors listed above. The initial model outputs are reviewed by distribution

planning engineers to identify and correct errors, to address technical issues, and to validate the circuit-level forecasts for overall reasonableness. Once validated, the forecast is exported to be used for the GNA capacity report and for detailed distribution power flow modeling as needed. Power flow models are generated by extracting circuit models from Geographic Information System (GIS), incorporating data refinements and populating the model with forecast loads from LoadSEER.

Once the power flow models are finalized, distribution planning engineers identify conventional distribution projects that mitigate forecast circuit performance issues revealed by the power flow results (i.e., distribution needs). Such mitigation is designed to resolve needs at the substation transformer bank, circuit, and line segment levels.

Distribution needs that would result in new distribution capital infrastructure if built, are included in the DDOR as Planned Investments and, if passing defined screens, are listed in the DDOR as Candidate Deferral Opportunities. Forecast grid deficiencies identified in the GNA that do not have a corresponding project in the DDOR either have operational-based solutions (which have little to no associated capital investment), are the result of modelling refinements, and/or have committed planned investments identified in a previous DIDF cycle. Therefore, the mitigation projects included in the DDOR address a subset of those GNA grid deficiencies that are anticipated to require new capital investment.

### 2. SDG&E's Distribution Planning Assumptions and GNA Scope

The following sections describe the study methodology and assumptions used to forecast and identify distribution needs that are reflected in SDG&E's 2021 GNA. These assumptions pertain to load forecasts, DER growth forecasts, and distribution operational switching/load transfer criteria over the distribution planning period or planning horizon. Additionally, the technical criteria for determining distribution needs identified in the GNA is described.

#### 2.1 SDG&E's Distribution Resources Planning Horizon

As directed by the Commission, SDG&E's distribution planning process uses a five-year forecast period (which includes the current year's summer peak) as the study horizon over which to identify grid needs at the circuit and substation transformer bank level.<sup>4</sup> SDG&E's 2021 GNA covers the 2021-2025 five-year planning horizon. SDG&E uses only the first three years of the five-year forecast (*i.e.*, a three-year horizon) when identifying needs associated with downstream line segments of a circuit.<sup>5,6</sup>

Line segment needs reflect the granular allocation of load and DER impacts based on a system-level forecast. Compared to needs identified for distribution circuits or substation transformer banks, where forecast DER impacts are cumulative, line segment needs are inherently uncertain and highly sensitive to locational allocations and individual customer load and DER adoption. Because individual customer decisions significantly influence line segment needs, infrastructure solutions tend to be smaller and

Decision at Section 3.4.1.1.

<sup>&</sup>lt;sup>5</sup> May 2019 Ruling, at 5-6.

SDG&E differentiates between a circuit need and a line segment need. A circuit need generally occurs on the portion of a circuit that has larger wire size and is close to the supplying substation (e.g., within one "electric" circuit-mile of the supplying substation). A line segment need generally occurs on the portion of the circuit that has a smaller wire size and is at a greater distance from the supplying substation (e.g., more than one mile away from the supplying substation). A typical circuit is 4-6 miles in length.

short-term in nature. Due to the high degree of forecast and modeling uncertainty associated with line segment needs that may arise beyond the third year of SDG&E's distribution planning horizon SDG&E does not assess whether there may be line segment needs during years four and five of SDG&E's five-year planning horizon.

### 2.2 SDG&E's Distribution System Load Forecast Assumptions

SDG&E's load growth forecast begins with the most recent CEC-approved SDG&E Integrated Energy Policy Report (IEPR) Load Modifier Mid Baseline-Low Additional Achievable Energy Efficiency (AAEE) California Energy Demand (CED) 2019 forecast. SDG&E's forecast of known new loads (e.g., specific requests for new electrical service) are deducted from the CEC system load growth forecast. The resultant system-level growth is allocated by customer class (residential, industrial, and commercial) proportional to the customer class' forecast annual energy consumption. The system-level customer class distribution is then allocated to SDG&E's distribution circuits using geospatial analysis. Expected impacts from known new loads are then added at the applicable circuits.

SDG&E uses the LoadSEER GIS geospatial forecasting program. This program uses satellite imagery and proprietary data analytics to score each acre in SDG&E's territory for the likelihood of increased load by customer class. This GIS model also uses historical land aerial imagery to help determine expansion trends that have occurred within specific areas and takes this information into account for the acre scoring analysis. After area scores are determined, the geospatial program allocates the customer class load growth projections to each parcel and maps the load growth to circuits based on closest proximity. The output of the geospatial program is an annual SDG&E peak megawatt (MW) growth by circuit and customer class for the forecast period. This growth is then uploaded into the LoadSEER forecasting program, which uses customer-class load shapes to turn the allocated customer class growth amount into a 576-hour load shape<sup>8</sup> that can then be applied to the circuit or bank load shape.

SDG&E uses a normalized and adverse 1-in-10-year (90<sup>th</sup> percentile of high loading) weather event forecast as the basis for making decisions regarding planned capital upgrades and permanent load transfers. Weather normalization is performed for each circuit by comparing the historical air temperature of a nearby weather station to historical substation peaks. A regression curve is created between substation loading and temperature values. Based on the most recent summer weather data and historical substation loading in response to weather, an adjustment is generated to calibrate the recent substation peak to a 1-in-2 weather year. LoadSEER then applies an adverse weather factor to each circuit to create the 1-in-10 weather year forecast, which is the basis for identifying distribution grid needs.

The geospatial load forecast is derived from the CEC load forecast and reviewed by for SDG&E distribution planning engineers. This activity includes identifying circuits where the geospatial forecast is not supported by historic loads and local knowledge. In these instances, distribution planning engineers must reallocate load growth among nearby circuits served from the same substation and/or tightly coupled adjacent substations. Typically, a circuit with an unreasonably high load growth is reduced and

<sup>&</sup>lt;sup>7</sup> Known new distribution loads are deducted from the system-wide forecast so that they can be added back in as local new load adjustments while maintaining consistency with the CEC forecast in aggregate.

<sup>&</sup>lt;sup>8</sup> This represents hourly loads for both a typical weekday and weekend day for each month.

the reduced load is added to nearby circuits. This effort preserves consistency with the CEC forecast and provides continuity with the geospatial methodology.

An important step to the forecast process is SDG&E distribution planning engineers' validation and adjustment of historical peak loads for distribution substation transformer banks and circuits. This process establishes a starting point for distribution loading projections that are consistent with the existing circuit configuration on a going-forward basis. The following guidelines for verifying and modifying historical loads are typically followed:

- Bank and circuit peak loads are obtained through either historical SCADA data, monthly recorded substation metering data, or cumulative advanced metering infrastructure (AMI) data.
   Peak demand (in MW) for banks as well as maximum current loading (in amps) for circuits are recorded along with peak date and time.
- Recorded peak load information is compared with adjacent days' peak load information to
  assess whether an unusually high or low load occurred during a planned or unplanned switching
  condition. Distribution Operations switching log information is reviewed to confirm the timing
  of the switching operations that create unusual or temporary configurations and the circuits
  impacted.
- Peak loads on circuits coincident with temporary switched loads are adjusted because loading
  under temporary switching conditions is not relevant for forecasting normal peak loads and may
  lead to double-counting or under-counting of loads. If a peak load is recorded after a newly
  executed permanent load transfer, then the previous historical loads will be automatically
  adjusted to maintain the present circuit configuration when analyzing historic load growth on
  the circuit.

Historical circuit peak loads are adjusted, if necessary, to account for the largest distributed generation facility served by a circuit being offline during that circuit's peak – also known as G-1 planning scenario. Multiple distributed generators on the same circuit may be grouped into the equivalent of a G-1 scenario if they have a reasonable risk of all being offline at the same time.

The inputs, process, and outputs for disaggregating the CEC forecast to circuits can be found in Appendix 1, which reflects work done in the Distribution Forecast Working Group (DFWG).

A detailed summary of SDG&E's substation bank and circuit peak demand forecasts that were utilized for this GNA are included in Appendix 2.

#### 2.3 SDG&E's Distribution System DER Growth Forecast Assumptions

Separate from load growth, SDG&E has incorporated DER adoption into its distribution bank and circuit forecast assumptions. The starting point for developing these circuit-level DER growth forecasts is the CEC's systemwide CED forecast. The CED forecast accounts for all behind-the-load meter resources: residential PV, retail non-residential PV, self-generation resources and energy efficiency for different customer classes, electric vehicles, energy storage, and Load Modifying Demand Response (LMDR).<sup>9</sup>

<sup>&</sup>lt;sup>9</sup> Load Modifying Demand Response reshapes or reduces the net load curve as opposed to Supply Resource Demand Response which is integrated into the California Independent System Operator energy markets.

This year, SDG&E completed all DER forecast disaggregation using methodologies discussed during the DFWG.

The system-level incremental MW capacity by DER technology type is allocated to the circuits based on methodologies specific to each DER type. Variables used to allocate incremental DER capacity geospatially include consumption by customer class, historical PV adoption by zip code, the s-curve trending model, weather zones, and many other factors specific to each type of DER. <sup>10</sup> SDG&E's Distribution System DER Growth Assumptions utilize the following documents to disaggregate the 2019 IEPR Mid Baseline-Low AAEE: <sup>11</sup>

- CED 2019 Load Modifiers Mid Baseline Mid AAEE Corrected MDHD
- CED 2019 Managed Forecast LSE and BA Tables Mid Demand Mid AAEE Case CORRECTED Feb 2020
- CED 2019 Managed Forecast LSE and BA Tables Mid Demand Low AAEE Case CORRECTED Feb 2020
- CED 2019 Hourly Results SDGE MID-LOW
- FINAL CEDU 2019 Baseline SDGE Mid Demand Case
- CED 2019 AAEE Savings by Planning Area and End Use

The inputs, process, and outputs for disaggregating each DER type can be found in the Appendix 3, which reflects work done in the DFWG.

A detailed summary of SDG&E's substation bank and circuit DER forecasts that were utilized for this GNA are included in Appendix 2.

### 2.4 SDG&E's Load Transfers and Switching Assumptions

SDG&E's 2021 GNA includes the results of SDG&E's electric distribution grid as a snapshot in time that includes planned load transfers that will be performed as well as committed planned investments from previous distribution cycles. Needs that can be addressed via operational or switching-based load transfers that require minimal costs to implement are included in the GNA but do not appear in the DDOR. Planned load transfers and switching operations are typically the lowest cost options to address an identified need as they utilize existing capacity on distribution circuits.

Table 1 summarizes the 2021 GNA deficiencies addressed through load transfers or phase balancing.

| 2021 GNA        | Facility ID |
|-----------------|-------------|
| Load Transfers  | • 2021_0405 |
|                 | • 2021_0635 |
|                 | • 2021_0902 |
|                 | • 2021_0992 |
|                 | • 2021_0993 |
| Phase Balancing | • 2021_0475 |

SDG&E's DER Growth Forecast Assumptions are subject to updating and revision in accordance with distribution planning criteria and guidance provided by the Commission.

<sup>&</sup>lt;sup>11</sup> Consistent with the Assigned Commissioner's Ruling on the adoption of Distributed Energy Resources Growth Scenarios issued August 9, 2017.

### 2.5 Grid Needs Assessment Scope

As directed in the Decision, SDG&E's 2021 GNA identifies distribution grid needs associated with the four distribution services that DERs can provide: distribution capacity, voltage support, reliability (backtie) and resiliency (microgrid). For simplicity in SDG&E's 2021 GNA, the word "peak thermal" represents "distribution capacity", "back-tie" represents "reliability (back-tie)" and "microgrid" represents "resiliency (microgrid)." SDG&E's 2021 GNA identifies peak thermal, voltage, back-tie, and microgrid needs at the substation transformer bank, circuit, and line segment levels.

As clarified in the May 2019 Ruling, the IOUs' respective GNAs are to include, as applicable, identified transmission planning projects that are not separately undergoing an analysis as part of the California Independent System Operator (CAISO) Transmission Planning Process (TPP) (*i.e.*, that include transmission planning needs for any of the four DER deferral services that would result in a transmission project under the jurisdiction of the CPUC). SDG&E does not have any such identified needs, as none of SDG&E's transmission facilities are under the jurisdiction of the CPUC.

Also, as clarified in the May 2020 Ruling, the IOUs' respective GNAs will include, as applicable, identified Pre-Application and Post-Application Projects that are (i) subject to the requirements of General Order (GO) 131-D, or which are expected to be subject to GO 131-D, and (ii) include CPUC jurisdictional distribution component(s) addressing a need associated with the four DER deferrable services. None of SDG&E's Pre-Application and Post-Application projects include distribution components that address a distribution need identified through the distribution planning process, and none can be deferred by DERs since all are associated with transmission projects that are not subject to deferral by DERs. The needs addressed by these distribution components are often associated with fire-hardening of certain transmission facilities where the co-located distribution components are relocated and may be hardened in the process. While some of the distribution components are being replaced in-kind, e.g., simply moving existing distribution under-build, others are new (e.g., new span or pole for distance). Accordingly, incidental changes in material are the result of hardening and building to SDG&E's standard distribution design, material, and sizing practices (e.g., stronger wire meeting current standard).

### 2.6 Customer Confidentiality

In order to respect and protect customer privacy, SDG&E follows aggregation and anonymization rules, the primary of which is referred to as the "15/15 rule." When publicly releasing aggregated customer usage data, the sample population must be more than 15 customers and no single customer should account for more than 15% of usage at any given time. Areas that do not meet these requirements will be redacted, as shown in Appendix 2. The public version of SDG&E's 2021 GNA reflects the redaction of data conforming with the Ruling on Data Confidentiality. <sup>13</sup>

As adopted in D.16-12-036.

R.14-08-013, Administrative Law Judge's Ruling Addressing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company's Claims for Confidential Treatment and Redaction of Distribution System Planning Data Ordered by Decisions 17-09-026 and 18-02-004 (July 24, 2018).

### 2.7 GNA Modeling Refinements

SDG&E's distribution planning process begins with the development of a distribution load forecast. This load forecast is disseminated internally for a variety of business purposes. SDG&E makes an initial determination of distribution needs using this forecast. Subsequent to the internal release of the forecast, SDG&E undertakes an additional review of the initially-identified needs. During the course of this review, some planning, forecasting, and modeling refinements were identified that resulted in the removal of the initially-identified need. Examples of these refinements include: removing redundant load additions from the forecast and incorporating recent updates to distribution facility ratings. Affected circuits will continue to be monitored for future needs.

Table 2 summarizes the refinements implemented subsequent to the internal dissemination of the distribution load forecast and prior to the publication of the GNA/DDOR on August 16, 2021. For the 2021-2022 DIDF cycle, no modelling refinements were identified for the 2021 GNA report.

| 2021 GNA              | Facility ID |
|-----------------------|-------------|
| Modelling refinements | None        |

Table 2 - SDG&E Model Refinements

#### 2.8 Near-term Needs

When needs arise for the current year, SDG&E creates immediate mitigation and initiates near-term projects to implement the necessary mitigation. Near-term needs require urgent action and the mitigation therefore does not qualify as a candidate deferral project. Accordingly, the DDOR does not address mitigation for near-term needs.

### GNA Results

Forecast distribution needs are the combined result of the inputs described in Appendix 1 and 2. Because it is the combined inputs (e.g., forecast load amounts and types of DER additions on a circuit) that determine the need for mitigation solutions, it is generally not possible to directly attribute an identified need to any one causal variable. Accordingly, SDG&E is unable to provide a listing of strictly "DER-driven needs" within the planning cycle. However, if a need arises, it will be appropriately included in the DIDF reports and process.

Additionally, per the Commission-adopted Grid Modernization framework, <sup>15</sup> SDG&E will incorporate programmatic and systemwide needs into its future GRC. For example, plans SDG&E has to upgrade monitoring and control systems were provided in SDG&E's 2019 GRC testimony (Ted Reguly) and will be addressed in the future GRC.

The GNA results are summarized below by the four distribution service types: peak thermal, voltage support, back-tie and microgrid. For each of the four service types, the GNA results are further

For example, a peak thermal overload could be a net result of "low" forecast loads and "high" projections of DER growth or "high" forecast load and "low" projections of DER growth – both contribute to the peak thermal overload.

<sup>&</sup>lt;sup>15</sup> D.18-03-023 Decision on Track 3 Policy Issues, Sub-Track 2 (Grid Modernization) (March 22, 2018).

categorized by whether the need is at the substation (bank), circuit, or line segment level. GNA results are included in Appendix 2.

Table 3 summarizes the grid needs within SDG&E's Distribution Planning Region and by service type.

|       |              | Total |   |   |    |
|-------|--------------|-------|---|---|----|
|       | Peak Thermal | Total |   |   |    |
| SDG&E | 18           | 1     | 5 | 0 | 24 |

Table 3 - Summary of the Number of Grid Needs by Distribution Service Type

Table 4 summarizes the grid needs by service type and by equipment type (e.g., substation/bank, circuit, or line segment). Multiple grid needs may be related and can be solved by a single planned investment.

|                        |              | Total   |          |           |       |
|------------------------|--------------|---------|----------|-----------|-------|
| <b>Equipment Type</b>  | Peak Thermal | Voltage | Back-Tie | Microgrid | Total |
| <b>Substation Bank</b> | 1            | 0       | 0        | 0         | 1     |
| Circuit                | 6            | 0       | 2        | 0         | 8     |
| Line Segment           | 11           | 1       | 3        | 0         | 15    |
| Totals                 | 18           | 1       | 5        | 0         | 24    |

Table 4 - Summary of the Number of Grid Needs by Distribution Service Type and Equipment Type

Table 5 summarizes the grid needs by need date.

| In-Service Date          |    |   |   |      | Total |
|--------------------------|----|---|---|------|-------|
| 2021 2022 2023 2024 2025 |    |   |   | 2025 | Total |
| 0                        | 17 | 0 | 0 | 2    | 19    |

Table 5 - Summary of the Number of Grid Needs by In-Service-Date

### 3.1 Distribution Capacity Needs

Distribution peak thermal services provided by DERs are either load-modifying or supply-modifying. In order for DERs to defer planned distribution infrastructure, the magnitude and timing of load changes and electrical output must correspond to the magnitude and timing of the distribution need — right place, time, amount, and certainty. This can be effectuated by dispatch of controllable DERs or, for non-controllable DERs (e.g., energy efficiency), by deploying enough capacity in advance to ensure the distribution need is met when it is needed.

Table 6 summarizes the peak thermal needs.

|       |            | Project Type |              |    |  |  |
|-------|------------|--------------|--------------|----|--|--|
|       | Substation | Substation   |              |    |  |  |
|       | Bank       | Circuit      | Line Segment |    |  |  |
| SDG&E | 1          | 6            | 11           | 18 |  |  |

Table 6 - Summary of the Number of Peak Thermal Grid Needs by Project Type

Table 7 summarizes the peak thermal needs by need date.

| In-Service Date |      |      |      |      | Total |
|-----------------|------|------|------|------|-------|
| 2021            | 2022 | 2023 | 2024 | 2025 | Total |
| 0               | 16   | 0    | 0    | 2    | 18    |

#### 3.2 Voltage Support Needs

Voltage Support services are circuit level dynamic voltage management services provided by an individual resource and/or aggregated resources capable of dynamically correcting excursions outside voltage limits.

Table 8 summarizes the voltage support needs.

|       | Substation | Substation |              |   |  |
|-------|------------|------------|--------------|---|--|
|       | Bank       | Circuit    | Line Segment |   |  |
| SDG&E | 0          | 0          | 1            | 1 |  |

Table 8 - Summary of the Number of Voltage Needs by Project Type

Table 9 summarizes the voltage needs by need date. All of the voltage support needs have a need date within the next three years, for the reasons specified in Section 2.1.

|      | Total                    |   |   |   |   |  |  |  |  |  |  |  |
|------|--------------------------|---|---|---|---|--|--|--|--|--|--|--|
| 2021 | 2021 2022 2023 2024 2025 |   |   |   |   |  |  |  |  |  |  |  |
| 0    | 1                        | 0 | 0 | 0 | 1 |  |  |  |  |  |  |  |

Table 9 - Summary of the Number of Voltage Grid Needs by In-Service-Date

### 3.3 Reliability (Back-Tie) Needs

Back-tie services are load-modifying or supply-modifying services that provide the utility operational capacity (*e.g.*, on an adjacent circuit) to restore service to an interrupted portion of the distribution system. Specifically, this service provides peak thermal capacity to provide service to customers during abnormal conditions and configurations. Back-tie service minimizes customer impacts during planned and unplanned outages.<sup>16</sup>

The 2021 GNA includes back-tie grid needs for substation banks, circuits, and line segments. Table 10 summarizes the back-tie grid needs.

|       |            | Project Type |              |       |
|-------|------------|--------------|--------------|-------|
|       | Substation |              |              | Total |
|       | Bank       | Circuit      | Line Segment |       |
| SDG&E | 0          | 2            | 3            | 5     |

Table 10 - Summary of the Number of Back-tie-Grid Need by Project Type

Table 11 summarizes the back-tie grid needs by need date.

|      | Total                    |   |   |   |   |  |  |  |  |  |  |
|------|--------------------------|---|---|---|---|--|--|--|--|--|--|
| 2021 | 2021 2022 2023 2024 2025 |   |   |   |   |  |  |  |  |  |  |
| 0    | 4                        | 0 | 0 | 1 | 5 |  |  |  |  |  |  |

Table 11 - Summary of the Number of Back-tie Grid Needs by In-Service-Date

<sup>&</sup>lt;sup>16</sup> 2019 Distribution Deferral Opportunity Report San Diego Gas and Electric, Appendix B.

### 3.4 Resiliency (Microgrid) Needs

As part of the Wildfire Mitigation Program (WMP), SDG&E is implementing mitigation measures to help reduce the risk of wildfires. As part of its Public Safety Power Shutoff (PSPS) Program, SDG&E may deenergize certain facilities that are within or cross Tier 2 and Tier 3 High Fire Threat District (HFTD) areas when forecasts predict extreme fire-threat conditions. To reduce the impacts of PSPS events on customers, SDG&E proposed several IOU-owned and IOU-controlled microgrids within its 2020 Wildfire Mitigation Plan (WMP).<sup>17</sup> These resiliency needs were reported in SDG&E's 2020 GNA. As of August 16, 2021, SDG&E has not proposed any additional IOU-owned and IOU-controlled microgrids; this is reflected in the tables below.

The 2021 GNA includes resiliency (microgrid) needs identified through SDG&E's WMP efforts. Table 12 summarizes the resiliency (microgrid) needs.

|       |            | Project Type |              |       |
|-------|------------|--------------|--------------|-------|
|       | Substation |              |              | Total |
|       | Bank       | Circuit      | Line Segment |       |
| SDG&E | 0          | 0            | 0            | 0     |

Table 12 - Summary of the Number of Microgrid Needs by Project Type

Table 13 summarizes the microgrid needs by need date.

|      | Total                    |   |   |   |   |  |  |  |  |  |  |
|------|--------------------------|---|---|---|---|--|--|--|--|--|--|
| 2021 | 2021 2022 2023 2024 2025 |   |   |   |   |  |  |  |  |  |  |
| 0    | 0                        | 0 | 0 | 0 | 0 |  |  |  |  |  |  |

Table 13 - Summary of the Number of Microgrid Needs by In-Service Date

### 4. Updates to the GNA

SDG&E's 2021 GNA conforms with data requirements identified in the Decision, the May 2019 Ruling, the May 2020 Ruling, and the Revised Attachment A. The following sections describe additional narrative requirements and SDG&E's suggested modifications for future GNAs.

### 4.1 Changes from SDG&E's 2020 GNA

There are no changes in data formats between SDG&E's 2021 GNA and SDG&E's 2020 GNA.

#### 4.2 GNA and online maps

In compliance with Commission directives, SDG&E is filing this 2021 GNA on August 16, 2021. Applicable data from SDG&E's 2021 GNA report data will be made available within an on-line map layer, which "pops-up" atop the circuit models in the DRP data access portal, to be viewed and downloaded via link or via API capabilities upon the next planned monthly data portal update. 19

<sup>&</sup>lt;sup>17</sup> San Diego Gas & Electric Company Wildfire Mitigation Plan ("WMP") (February 7, 2020), at 76-80.

D.18-02-004 and Administrative Law Judge's Ruling Modifying the Distribution Investment Deferral Framework Process (filed 5/07/19).

As mentioned in SDG&E's Advice Letter 3420-E, SDG&E's modified plan to implement a DRP data access portal includes the objective of implementing updates to the data access portal by the first week of each month.

## 4.3 Modify future GNA requirements

SDG&E does not propose any modification to the Commission's adopted GNA process and/or reporting requirements.

### Appendix 1 – Load Disaggregation

#### Load Disaggregation Process

Load disaggregation, Figure 2,<sup>20</sup> is the process of allocating the CEC load growth to circuits. SDG&E uses LoadSEER geospatial modelling to perform this disaggregation. The method consists of six major steps:

- 1. **Baseline Growth**. Adjust the CEC's Mid Baseline Scenario load projections (i.e. MW) to avoid double counting specific DERs.
- 2. **Calculate Growth**. Calculate load growth (i.e. annual growth) from the adjusted baseline projections and apply the growth to the latest observed normalized distribution system coincident peak.
- 3. **Allocate Block Loads**. Allocate known block load growth based on expectations or new expanded service.
- 4. **Allocate Geo-spatial Loads**. Allocate remaining load growth based on the geo-spatial model. The geo-spatial model is a predictive model that captures location and environmental factors influencing growth on the distribution system. The geo-spatial models are calibrated to each utility's distribution system.
- 5. **Local Planning Engineer Review**. Results are reviewed by local planning engineers with specialized knowledge of local areas.
- 6. Circuit Level Review. Planning engineers review and approve adjustments to the circuit level.

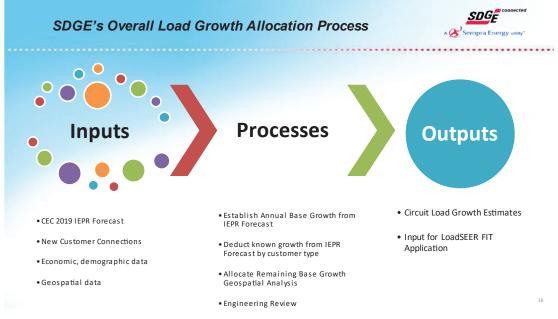


Figure 2 – Overview of Load Disaggregation

From DFWG meeting on May 13<sup>th</sup>, 2021.

## Appendix 2 - Substation Bank and Circuit Forecast Detail Summary

### GNA – Distribution Circuits, Substations, Sub-transmission Capacity Service

Refer to "SDG&E GNA TABLES 2021 – PUBLIC.xls" tab "Cir-Bank Capacity"

### GNA - All Other Grid Service Needs

Refer to "SDG&E GNA TABLES 2021 – PUBLIC.xls" tab "Ruling – All Other"

### Appendix 3 - DER Disaggregation Process

#### **General Process**

Most of the information within Appendix 3 originates from the DFWG including the Progress Report R.14-08-013 filed on July 2<sup>nd</sup>, 2018. The working group was tasked to develop the appropriate assumptions and methods used to disaggregate various DER types. Upon completion, a final progress report was written summarizing the various methodology each utility would implement. Figure 3<sup>21</sup> is an overview of activities using various disaggregation methods and variables depending on each DER type. For the subsequent flowcharts, the software tool LoadSEER is considered proprietary software and is briefly described in section 2.2. Nexant's SPIDER™ (Spatial Penetration & Integration of Distributed Energy Resources) model is also considered to be proprietary and is used in the forecasts of Photovoltaics (PV), Electric Vehicles (EV) and for calculating the load shape for Energy Storage (ES).

DER disaggregation begins with the CEC's IEPR forecast for each DER and then distributes the DER forecast to the circuit level. This section discusses the SDG&E's disaggregation methods for the following five DERs: Additional Achievable Energy efficiency (AAEE), Photovoltaics (PV), Energy Storage (ES), Electric Vehicles (EV), and Load Modifying Demand Response (LMDR).

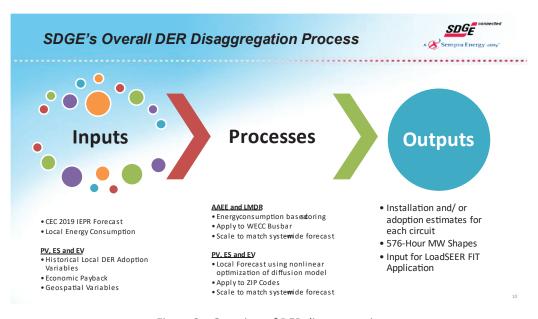


Figure 3 – Overview of DER disaggregation

<sup>&</sup>lt;sup>21</sup> From DFWG meeting on May 13<sup>th</sup>, 2021.

### Additional Achievable Energy Efficiency (AAEE)

SDG&E bases their AAEE allocations on a Proportional Allocation Method. This method consists of (1) using the CEC service territory or busbar forecasts, and (2) allocating to circuits based on energy sector after calibrating data errors. Figure 4 <sup>22</sup>descirbes Energy Efficiency dissagragation.

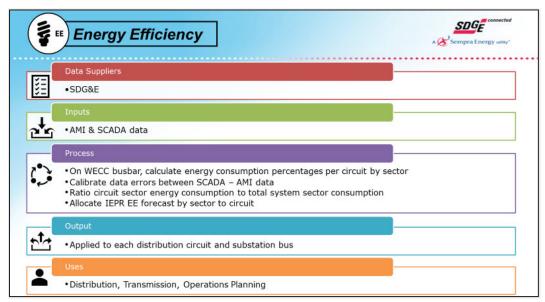


Figure 4 – Energy Efficiency disaggregation

#### Residential and Non-Residential Photovoltaics

SDG&E is refining adoption models for locational disaggregation of PV. Adoption models are S-curve models that capture how customers adopt a technology through time. The classic S-curve model is the Bass Diffusion model. Within a Bass Diffusion model, three parameters (P, Q, and M) are optimized to explain monthly adoption patterns. In dynamic models the values of these parameters may change through time in response to economic conditions, customer behavior, and market activities. These parameters are listed below and represent the key uncertainties in the model.

P: This parameter is for innovation and represents the behavior of early adopters for a technology as well as advertising effects. The value of this parameter may be modelled in a variety of ways.

Q: This parameter is for imitation and represents word-of-mouth adoption and the influence of pervious adopters. As with the P parameter, this value may be modelled in a variety of ways.

M: This parameter is the market potential for the technology. Market potential captures the impacts of policy, policy changes, economics, tax laws, customer attitudes, and technology evolution. As with the P and Q parameters, there are a variety of ways to model this parameter.

Figure 5 shows how an S-curve models captures cumulative adoption (left) based on incremental adoption (right). Actual adoption data are shown in red and the model results are shown in blue.

<sup>&</sup>lt;sup>22</sup> From DFWG meeting on May 13<sup>th</sup>, 2021

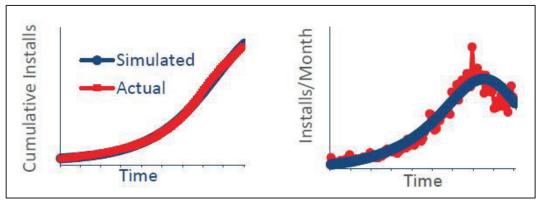


Figure 5 – S-Curve Model

By using S-curve models, SDG&E can generate bottom-up forecasts of PV adoption with parameters estimated at the ZIP code level. The bottom-up forecast is used for disaggregation. Figure 6 <sup>23</sup>describes the PV disaggregation.

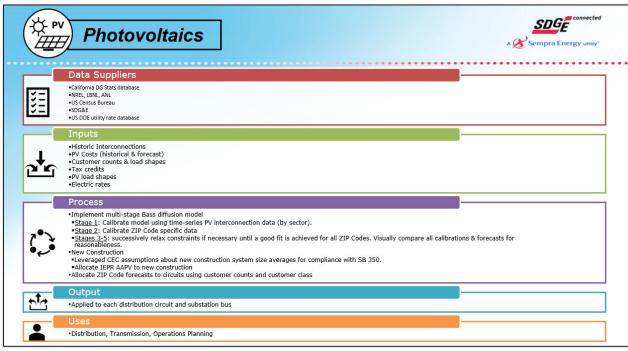


Figure 6 – Photovoltaic disaggregation

#### **PV Data Sources**

A variety of publicly available data sources combined with select SDG&E-specific data were leveraged in the PV forecasting and allocation process. Table 1 summarizes the key data sources used in the PV allocation process.

<sup>&</sup>lt;sup>23</sup> From DFWG meeting on May 13<sup>th</sup>, 2021

| Model Input                              | Source(s)   |
|--|---|
| Historical Solar PV Adoption             | California DG Stats Database <sup>24</sup>  |
| <b>Hourly Customer Load Shapes</b>       | SDG&E   |
| Hourly PV Generation                     | Solar Irradiance, by climate zone, from SDG&E PV output from NREL's System Advisor Model <sup>25</sup>  |
| Historical PV Costs                      | CA DG Stats <sup>26</sup> and LBNL Tracking the Sun report <sup>27</sup>  |
| Forecast PV Cost Reduction<br>Percentage | NREL's Cost-Reduction Roadmap for Residential Solar Photovoltaics (PV), 2017–2030 <sup>28</sup>   |
| Average PV System Sizes                  | California DG Stats Database  |
| Electric Rates (TOU)                     | SDG&E (TOU-DR1 for residential, AL-TOU Secondary <500kW for non-residential), NREL US Utility Rate Database (historical) <sup>29</sup>  |
| Premise Counts                           | SDG&E (current), US Census (2010) and American<br>Community Survey (2016) (forecast growth by ZIP,<br>California Energy Commission (forecast growth by utility) <sup>30</sup> |
| Suitable Rooftop Area<br>(Commercial)    | NREL LIDAR Study and Database Viewer <sup>31,32</sup>   |
| Tax Credits                              | DSIRE Database <sup>33</sup>  |

Table 14 - Key Data Sources for PV disaggregation

### **Energy Storage**

SDG&E generated energy storage adoption forecasts using a ZIP-code-level Bass Diffusion method calibrated to historical energy storage interconnection data. To capture correlations between PV adoption and solar-paired energy storage adoption, the energy storage forecasts made use of the PV adoption forecasts. This approach considered the different customer economics and suitable building stocks for solar-paired versus stand-alone energy storage.

SDG&E then applied load shapes calculated using an energy storage dispatch optimization module. This module contains a mixed-integer program capable of simulating the optimal dispatch of a stand-alone or solar pair battery storage system for any input customer load profile, system size (PV and/or storage), electric rate structure and PV generation shape.

The model's energy storage forecasts provided a basis for allocating the energy storage forecasts among ZIP codes, permitting further allocation to circuits. Figure 7<sup>34</sup> describes the ES disaggregation.

<sup>&</sup>lt;sup>24</sup> https://www.californiadgstats.ca.gov/downloads/

<sup>&</sup>lt;sup>25</sup> https://sam.nrel.gov/

<sup>&</sup>lt;sup>26</sup> https://www.californiadgstats.ca.gov/downloads/

<sup>&</sup>lt;sup>27</sup> https://emp.lbl.gov/tracking-the-sun

<sup>&</sup>lt;sup>28</sup> <a href="https://www.nrel.gov/docs/fy18osti/70748.pdf">https://www.nrel.gov/docs/fy18osti/70748.pdf</a> (midpoint between "low" and "very aggressive" rate of cost decline)

<sup>&</sup>lt;sup>29</sup> https://openei.org/apps/USURDB/

<sup>&</sup>lt;sup>30</sup> CED 2019 Load Modifiers - Mid Baseline Mid AAEE - corrected MDHD

<sup>31</sup> https://maps.nrel.gov/nsrdb-viewer

<sup>32</sup> https://www.nrel.gov/docs/fy16osti/65298.pdf

<sup>33</sup> https://programs.dsireusa.org/system/program/detail/1235

<sup>&</sup>lt;sup>34</sup> From DFWG meeting on May 13<sup>th</sup>, 2021

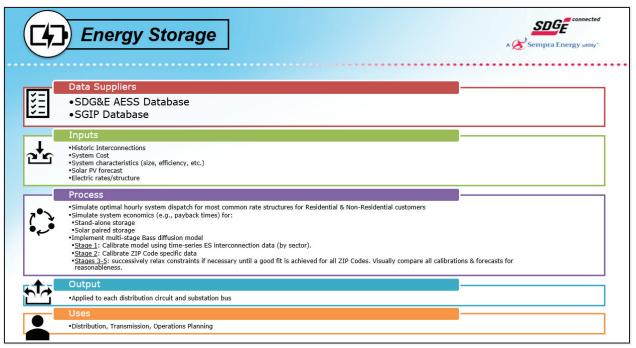


Figure 7 – Energy Storage disaggregation

#### **ES Data Sources**

Key data sources used in the Energy Storage allocation process are illustrated in Table 2.

| Model Input                             | Source(s)  |
|---|--|
| Historical Battery Storage Adoption     | SDG&E Advanced Energy Storage Systems database   |
| <b>Hourly Customer Load Shapes</b>      | SDG&E  |
| <b>Historical Battery Costs</b>         | Self-Generation Incentive Program database <sup>35</sup>   |
| Forecast Battery Cost Reduction         | Greentech Media <sup>36</sup>  |
| Percentage                              |  |
| <b>Historical State Incentive Rates</b> | Self-Generation Incentive Program database   |
| <b>Average Battery System Sizes</b>     | SDG&E Advanced Energy Storage Systems database   |
| Electric Rates                          | SDG&E (current TOU-DR1 for residential, AL-TOU Secondary <500kW for non-residential), NREL US Utility Rate Database (historical) <sup>37</sup> |

Table 15 - Key Data Sources for Energy Storage Disaggregation

<sup>35</sup> https://www.selfgenca.com/documents/reports/statewide projects.

https://www.utilitydive.com/news/not-so-fast-battery-prices-will-continue-to-decrease-but-at-a-slower-pace/518776/

<sup>37</sup> https://openei.org/apps/USURDB/

#### **Electric Vehicles**

SDG&E based their light duty EV allocations on a Bass diffusion model at the ZIP code level while calibrating to available time-series DMV and statewide sales data. The model included a consumer choice model, where different vehicle types (e.g., conventional, electric, plug-in electric hybrid) competed for market share based on their relative consumer appeal. Vehicle capital costs, incentives, fuel and maintenance costs, and vehicle range impacted consumer appeal. The model is used to disaggregate the EV forecast based on customer information to the ZIP code level, which is then allocated to circuits. Figure 8 <sup>38</sup>describes the EV disaggregation.

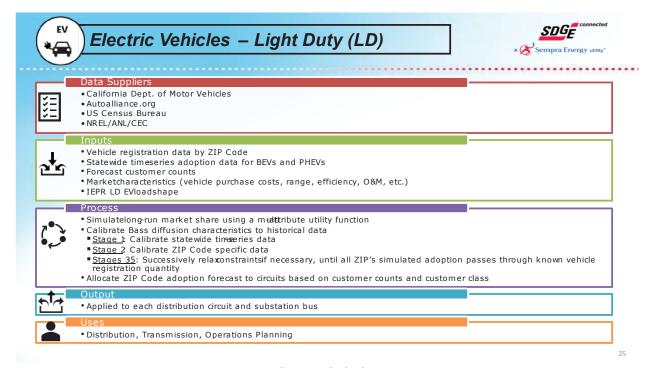


Figure 8 – Electric Vehicle disaggregation

SDG&E based their medium/heavy duty vehicle allocations on the stock of existing medium and heavy duty vehicles obtained from the California Department of Motor Vehicles (DMV).<sup>39</sup> Vehicle stock was available at the ZIP Code level of aggregation. ZIP Code level forecasts were then allocated to individual circuits based on customer counts.

<sup>&</sup>lt;sup>38</sup> From DFWG meeting on May 13<sup>th</sup>, 2021

<sup>39</sup> https://data.ca.gov/dataset/vehicle-fuel-type-count-by-zip-code

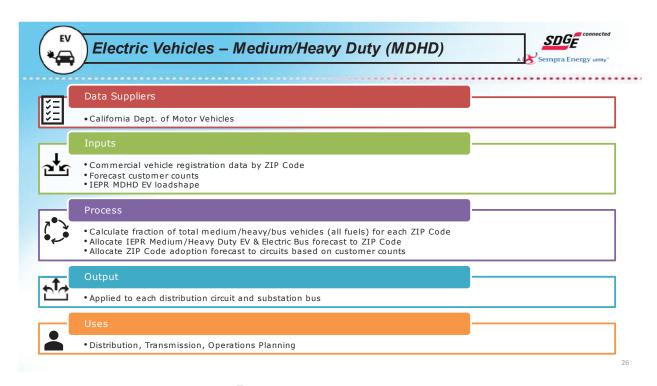


Figure 9 – MDHD Electric Vehicle disaggregation

#### **EV Data Sources**

Key data sources used in the EV allocation process are illustrated in Table 3.

| Model Input                                  | Source(s)  |
|--|--|
| Historical Time-Series EV Sales (State-wide) | Auto Alliance Vehicle Sales Data Viewer <sup>40</sup>  |
| Snapshot EV Registration Data by ZIP code    | California Department of Motor Vehicles (snapshot through end 2019) <sup>41</sup>  |
| Average Vehicles/Customer                    | Calculated from above DMV data and current customer counts from SDG&E  |
| <b>Customer Counts</b>                       | SDG&E (current), US Census (2010) and American<br>Community Survey (2016) (forecast growth by ZIP),<br>California Energy Commission (forecast growth by utility) <sup>42</sup> |
| Fuel Costs                                   | Energy Information Administration (historical) <sup>43</sup> , California Energy Commission (forecast change) <sup>44</sup>  |

<sup>&</sup>lt;sup>40</sup> https://autoalliance.org/energy-environment/advanced-technology-vehicle-sales-dashboard/

<sup>41</sup> https://data.ca.gov/dataset/vehicle-fuel-type-count-by-zip-code

<sup>&</sup>lt;sup>42</sup> CED 2019 Load Modifiers - Mid Baseline Mid AAEE - corrected MDHD

<sup>43</sup> https://www.eia.gov/electricity/data/state/avgprice annual.xlsx

<sup>44</sup> https://efiling.energy.ca.gov/getdocument.aspx?tn=223205

| Vehicle Cost, Range, Efficiency,<br>Maintenance Cost | NREL <sup>45</sup> , ANL <sup>46</sup> , EIA <sup>47</sup> , CEC <sup>48</sup> |
|--|--|
| Vehicle Incentives                                   | Clean Vehicle Rebate Project <sup>49</sup>                                     |
| Tax Credits  | Internal Revenue Service <sup>50</sup>   |

Table 16 - Key Data sources for Electric Vehicles disaggregation

#### Demand Response

SDG&E used sector regression trend models based on the ratio of enrolled LMDR participants to total available customers to determine the allocation factors. Due to the low impact of LDMR and the uncertainty related to the upcoming change to time of use rates, LMDR has minimal effect on the final forecast. Figure 9<sup>51</sup> describes the LMDR disaggregation.

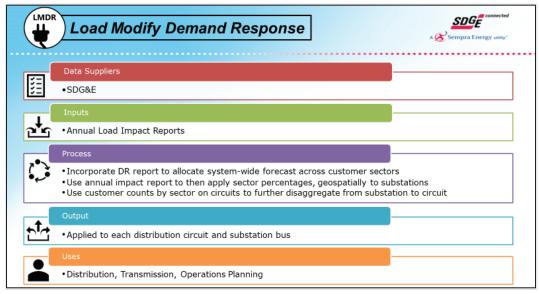


Figure 9 – LMDR disaggregation

### Disaggregation Methods

Disaggregation methods used for each DER vary based on the availability of data, the maturity of the DER technology, resource constraints, and practical considerations. Each of these characteristics impacts the level of rigor applied to the disaggregation method. For example, for a DER with limited market adoption data, analysts are limited to simple disaggregation methods. However, for a DER with plentiful time series data on adoption location and customer characteristics, more complex methods can be utilized.

• **Proportional Allocation.** A proportional allocation method disaggregates the DER forecast to circuits based on utility data for the circuit (load, energy, or number of customers). Based on

<sup>45</sup> https://www.nrel.gov/docs/fy18osti/70455.pdf

<sup>46</sup> https://www.anl.gov/es/vision-model-download

<sup>&</sup>lt;sup>47</sup> https://www.eia.gov/outlooks/aeo/data/browser/

<sup>48</sup> https://efiling.energy.ca.gov/getdocument.aspx?tn=221893

<sup>49</sup> https://cleanvehiclerebate.org/eng

<sup>50</sup> https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d

<sup>&</sup>lt;sup>51</sup> From DFWG meeting on May 13<sup>th</sup>, 2021

these data, a fraction is computed for each circuit as the ratio of the data value for that circuit divided by the total across all circuits. For example, the ratio may be calculated as the amount of energy on a circuit divided by the total energy across all circuits and may be based on either historic or forecast load data. Another approach is to use adoption of one technology to drive adoption patterns for another technology. Refinements and complexity are introduced by including sector or rate class data (e.g., residential and non-residential) to compute the ratios.

- Propensity Models. Propensity models base the disaggregation on customer characteristics that
  are used to compute a propensity score. Based on the score, a fraction is computed for each
  area as the ratio of the score for that area divided by the sum of the scores across all areas. The
  scores are typically computed using statistical methods (e.g., regression, machine learning) with
  cross section data that identify key variables that are correlated with customer adoption and
  estimate scoring weights or parameters for these variables. For example, the propensity models
  could be estimated using ZIP code data, in which case the models relate historical adoptions to
  customer characteristics in each ZIP code.
- Adoption Models. This approach uses a bottom-up adoption forecast based on observed adoption patterns and estimated adoption model parameters. Generally, these models are based on time-series data that capture changes in adoption through time. These models are S-Curve models (e.g., Bass Diffusion Models) and they forecast technology adoption considering the characteristics of early adopters, factors that drive market potential, and adoption rates applied to the remaining potential. Figure 10 shows a generalized S-Curve model which forecasts cumulative (red) and incremental (blue) adoptions through time. The bottom-up adoption forecasts for all areas are used to compute a set of fractions that are then used to allocate DER impacts.

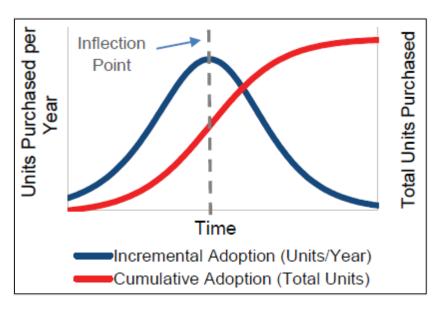
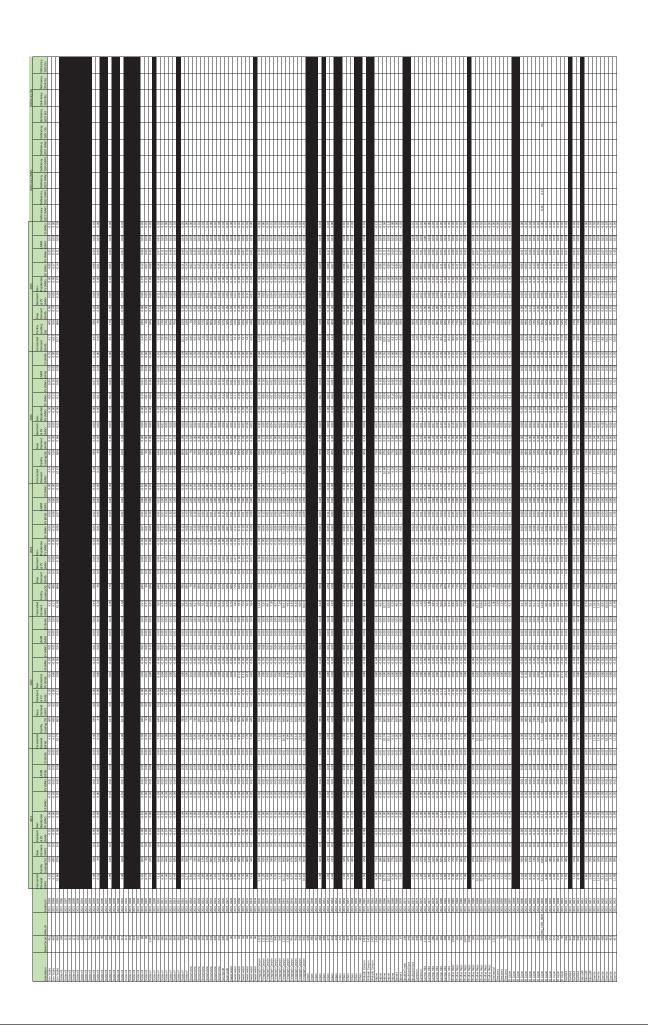


Figure 10 – Generalized S-Curve Model

### 2021 Grid Needs Assessment Tables of San Diego Gas & Electric Company

| Deferry Deferry  |  |   |   |   |   |  |   |   |   |   |   |  |   |   |   |  |   |   |  |  |
|--|--|---|---|---|---|--|---|---|---|---|---|--|---|---|---|--|---|---|--|--|
| Orthology (Defency Options) 2002 (b) 2002 (b) 2003 (b) 20 |  |   |   |   |   |  |   |   |   |   |   |  |   |   |   |  |   |   |  |  |
| (1989) Option of Deficiency Control (1989) 2025 (1989) |  |   |   |   |   |  |   |   |   |   |   |  |   |   |   |  |   |   |  |  |
| Deficiency Deficiency Deficiency Deficiency Deficiency Deficiency Deficiency Doors (Deficiency Doors ( |  |   |   |   |   |  |   |   |   |   |   |  |   |   |   |  |   |   |  |  |
| New    | 3 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.  | 000 000 000<br>001 000 000<br>001 000 000   | 6 0.53 0.00 0.00<br>6 0.53 0.00 0.00<br>8 0.14 0.00 0.00<br>8 0.01 0.00 0.00  | 11 000 000 000<br>10 000 000 000<br>10 000 000  | 2 0.41 0.00 0.00<br>0.01 0.01 0.00<br>11 0.00 0.00  | 2 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.  | 8 0.03 0.00 0.00<br>8 0.03 0.00 0.00<br>8 0.03 0.00 0.00  | 000 000 000 000 000 000 000 000 000 00  | 2 0.00 0.000 0.000<br>0.000 0.000 0.000<br>0.000 0.000 0.000  | 000 000 000<br>0012 000 000<br>0014 000 000   | 2 0.03 0.04 0.03<br>0.03 0.04 0.05<br>0.03 0.05<br>0.03 0.05<br>0.03 0.05   | 3 0.00 0.00 0.00<br>11 0.00 0.00 0.00<br>2 0.50 0.00 0.00<br>6 0.00 0.00                         | 5 0.03 0.04 0.00<br>5 0.03 0.04 0.00<br>6 0.13 0.04 0.03<br>7 0.01 0.04 0.00  | 6 0.01 0.00 0.00<br>6 0.00 0.00 0.00<br>3 0.11 0.00 0.03                            | 11 0.00 0.00 0.00<br>10 0.00 0.00 0.00<br>10 0.00 0.00 0.00<br>10 0.00 0.00 0.00<br>10 0.00 0.00  | 86 0.05 0.00 0.00<br>11 0.07 0.00 0.00<br>2 0.02 0.00 0.00<br>10 0.01 0.00<br>10 0.01 0.00   | 0 0.03 0.00 0.00<br>0.00 0.00 0.00<br>4 0.01 0.00 0.00<br>0.02 0.00 0.00      | 6 0.23 0.00 0.00<br>0 0.21 0.00 0.00<br>0 0.01 0.00 0.00<br>0 0.11 0.00 0.00<br>2 0.00 0.00   | 7 0.00 0.00 0.00<br>10 0.01 0.00 0.00<br>10 0.02 0.00 0.00<br>11 0.03 0.00<br>12 0.11 0.00<br>13 0.03 0.00<br>14 0.03 0.00<br>15 0.03 0.00<br>16 0.03 0.00<br>17 0.03 0.00<br>18 0.03 0.00<br>19 0.00<br>10 0.0 | 6 0.03 0.00 0.00<br>6 0.03 0.00 0.00   |
| Period   P   | 10 000 000 000 000 000 000 000 000 000   | 00 00 00 00 00 00 00 00 00 00 00 00 00  | 18 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.  | 000 000 000 000 000 000 000 000 000 00  | 00 0.00 0.00 00<br>00 0.00 0.00 00<br>00 0.00 0.00 00<br>00 0.00 0.00 0.00  | 000 000 000 000 000 000 000 000 000 00   | 00 0.00 0.13 0.00<br>00 0.00 0.05 0.00<br>00 0.00 0.05 0.00   | 01 0.00 -0.05 -0.0<br>03 0.00 -0.25 -0.0<br>04 0.05 -0.12 -0.1  | 00 0.00 0.018 0.012 0.00 0.00 0.00 0.00 0.00 0.00 0.0   | 22 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0   | 10- 220- 800 00<br>10- 910- 000 00<br>10- 910- 000 00   | 00 0.00 0.03<br>40 0.05 0.03 0.01<br>00 0.00 0.03 0.01   | 10- 930- 000 00<br>10- 930- 000 0 | 01 0.00 0.03 0.01   | 70 000 000 00 00 00 00 00 00 00 00 00 00  | 00 0.00 0.041 0.00 0.00 0.00 0.00 0.00 0   | 000 000 000 000 000 000 000 000 000 00  | 11 0.00 0.00 0.00<br>12 0.00 0.00 0.00<br>13 0.00 0.00 0.00<br>14 0.00 0.00 0.00<br>15 0.00 0.00 0.00<br>16 0.00 0.00 0.00<br>17 0.00 0.00 0.00<br>18 0.00 0.00 | M  | 10 000 000 10<br>10 000 000 10<br>10 000 000 10  |
| Green and   Faithy   Base   Green and   Faithy   Base   Green and   Green an   | 000 158 198 0<br>000 520 428 0<br>001 520 428 0<br>001 158 199 0   | 00 6.39 518 0<br>02 6.39 518 0<br>03 867 708 0  | 0 985 761 00  | 000 927 798 0<br>001 524 428 0<br>011 11.44 928 0<br>020 526 688 0  | 00 6.66 80% 0<br>7.48 6.1% 0<br>10 7.48 6.1% 0<br>00 7.48 6.0% 0  | 293 2465 0<br>293 275 0<br>200 283 775 0<br>200 264 775 0  | 00 508 41% 0<br>01 1.87 15% 0<br>03 2.34 41% 0  | 00 1.64 13% 0<br>00 6.2% 5.0% 0<br>03 9.0% 72% 0  | 00 021 706 0<br>07 674 506 0<br>01 289 266 0  | 00 374 475 0<br>00 934 755 0<br>00 676 560 0  | 22.9 45% 0<br>22.9 45% 0<br>22.9 2.9 2.9 0<br>23.9 70% 0  | 0.0 4.7.9 38% 0.00<br>0.0 5.1.9 42% 0.00<br>0.0 9.33 75% 0.40<br>0.0 8.2.4 66% 0.00              | 00 5.93 dens 0<br>00 3.77 30% 0<br>00 81.7 56% 0<br>01 2.63 21% 0<br>01 7.43 59% 0  | 00 842 685 0<br>00 913 735 0<br>02 10.68 865 0                                      | 00 236 988 0<br>00 579 405 0<br>01 847 388 0<br>01 477 388 0<br>01 571 468 0  | 00 415 35% 0<br>011 4.5 37% 0<br>02 83.8 57% 0<br>00 6.2 51% 0   | 000 1151 1276 0<br>001 4446 3000 0<br>002 820 5151 0<br>000 925 6596          | 00 121.5 878 0<br>00 38.7 314 0<br>00 8.6 298 0<br>00 91.9 578 0<br>01 2.8 578 0  | 011 10.63 80% 0<br>000 37.9 20% 0<br>02.5 26.0 60% 0<br>03.5 55.0 41% 0<br>03.5 88.9 81% 0<br>03.5 6.9 50% 0   | 03 624 40% 0   |
| 0.12 0.00 0.00 0.00 0.00 0.00 0.00 0.00  | 0 000 000 000 000 000 000 000 000 000  | 0.000 0 | 0.000 | 0.000 | 0 000 000 800-<br>0- 000 000 800-<br>0- 000 000 800-<br>0- 000 000 800-<br>0- 000 000 800-  | 0.000 0.00 0.00 0.00 0.00 0.00 0.00 0.   | 0.000 0.00 0 | 0 000 000 000 000 0   | 0.000 | 0.000 0.00 0 | 0 000 000 km  | 000 000 000<br>000 000 000<br>000 000 000<br>000 000   | 0.000   | 0 000 000 010   | 0001 0.00 0.00 0.00 0.00 0.00 0.00 0.00   | 0 000 100 800<br>0 000 100 000<br>0 000 000 000<br>0 000 000 000<br>0 000 00   | 0 000 200 800-<br>0- 000 000 000<br>0- 000 000 000                            | 0111 0.00 0.00 0.00 0.00 0.00 0.00 0.00   | 013 007 000 0<br>008 001 000 0<br>010 000 0   | 0- 100 031 000 0<br>0-013 000 00<br>0-013 000 0  |
| 2034  Recident Report  Annual Alexandre Record  Annual Alexandre Record | 000 000 000 000 000 000 000 000 000 00   | 000 | 000 000 000 000 000 000 000 000 000 00  | 000 000 000 000 000 000 000 000 000 00  | 0.00 0. | 000 000 000 000 000 000 000 000 000 00   | 010 000 000<br>010 000 000<br>010 000 000   | 0.01 0.00 0.01 0.01 0.01 0.01 0.01 0.01   | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 000 000<br>013 000 000<br>000 000<br>000 000  | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 0.00 0.00 0.00<br>0.00 0.00 0.00<br>0.15 0.05 0.01<br>0.00 0.00                                  | 29 0 000 000<br>90 0 000 000<br>90 0 000 000<br>90 0 000 00   | 100 000 000<br>000 000  | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 0.00 0.00 0.05<br>0.00 0.00 0.03<br>0.00 0.00 0.03<br>0.00 0.00  | 000 000 000 000 000 000 000 000 000 00  | 000 000 000 000 000 000 000 000 000 00  | 0.22 -0.03 -0.01<br>0.00 -0.01 -0.03<br>0.01 -0.03 -0.03<br>0.00 -0.02 -0.15<br>0.00 -0.03 -0.15<br>0.00 -0.03<br>0.01 -0.03   | 200 200 100<br>200 200 100   |
| Fore cotted   Red   Re   | 100 5.70 80% 60% 60% 60% 60% 60% 60% 60% 60% 60% 6   | 000 000 000 000 000 000 000 000 000 00  | 0.00 7.95 685   | 0.00 5.38 628 028 020 0.00 0.00 0.00 0.00 0.00 0.00   | 0.00 6.60 80%<br>0.00 7.54 61%<br>0.01 7.48 61%<br>0.00 7.55 60%  | 0.00 2.95 5.95 0.05 0.00 0.00 0.00 0.00 0.00 0   | 000 5.12 41%<br>000 5.24 42%<br>000 2.41 19%  | 0.00 1.64 13%<br>0.00 6.32 5.1%<br>0.00 0.13 73%  | 0.00 0.20 746<br>0.00 0.848 698<br>0.00 2.90 208  | 0.003 7.40 469<br>0.003 9.15 739<br>0.003 6.77 549<br>0.003 0.003   | 0.00 5.00 47%<br>0.00 2.21 42%<br>0.001 2.60 22%  | .001 4.7N 38%<br>-0.01 5.2N 42%<br>-0.01 9.02 72%<br>-0.03 8.43 68%                              | 0.00 5.99 40%<br>0.00 3.77 30%<br>0.00 8.29 66%<br>0.001 2.66 21%<br>0.000 7.54 60%   | 0.00 8.51 66%<br>0.00 9.18 74%<br>0.02 10.61 85%                                    | 0.00 2.88 98%<br>0.00 4.78 40%<br>0.00 4.88 77%<br>0.00 4.77 39%<br>0.00 5.78 46%   | 4.22 395<br>0.01 4.59 375<br>0.00 8.41 375<br>0.00 8.41 375<br>0.00 6.34 375<br>0.00 6.34 575  | 000 455 300<br>000 455 300<br>000 328 528                                     | 0.002 10.09 81%<br>0.003 388 31%<br>0.003 388 31%<br>0.003 8.72 39%<br>0.002 8.11 51%<br>0.002 9.11 57%<br>0.003 2.18 57%   | .0.01 10.45 848 2496 0.00 2.46 200 0.00 2.46 200 0.00 0.00 0.00 0.00 0.00 0.00 0.00  | 1500 NS.R. 120.D.  |
| COMPANY EVENTOR (COMPANY)  | -0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 0.00 0. | 0.05 0.03 0.00<br>0.05 0.03 0.00<br>0.08 0.01 0.00  | 000 000 000 000 000 000 000 000 000 00  | -0.07 0.27 0.00<br>-0.05 0.00 0.00<br>-0.05 0.03 0.00<br>-0.05 0.00   | 0.03 0.00 0.00 0.00 0.00 0.00 0.00 0.00  | 000 000 000   | 000 000 000 000   | -007 0.05 0.00<br>-008 0.00 0.00<br>-012 0.13 -0.02<br>-0.03 0.00   | 000 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 0.00 -0.07 0.01 0.00<br>-0.01 0.02 0.00<br>-0.01 0.02 0.00<br>-0.01 0.02 0.00<br>-0.02 0.03 0.00 | 000 000 000 000 000 000 000 000 000 00  | 000 000 000   | 000 000 000 000 000 000 000 000 000 00  | 000 000 000 000 000 000 000 000 000 00   | 0.00 0.00<br>0.00 0.00<br>0.00 0.01<br>0.00 0.01                              | 0.09 0.13 0.00 0.00 0.00 0.00 0.00 0.00 0.00  | 000 000 000 000 000 000 000 000 000 00   | 000 000 000 000 000 000 000 000 000 00   |
| 20.3   Section 1   Section 2   | 000 000 00<br>000 000 00<br>000 000 00<br>000 000 00   | 0000 0000 000   | 0.0 0.02 0.00 0.00 0.00 0.00 0.00 0.00  | 000 000 000 000 000 000 000 000 000 00  | 0.0 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.   | 000 000 000 000 000 000 000 000 000 00   | 0.0 0.00 0.07<br>0.0 0.00 0.07<br>0.0 0.00 0.0  | 000 000 000   | 000 000   | 910- 100 00<br>910- 100 00  | 000 000 000 000 000 000 000 000 000 00  | 950- 000 00<br>610- 100 00<br>100- 100 00  | (#**) (000 000 000 000 000 000 000 000 000 0  | 000 000   | 000 000 000 000 000 000 000 000 000 00  | 18 TO 10 TO  | 200- 100 00<br>200- 100 00<br>200- 100 00<br>200- 100 00                      | 000 000 000 000 000 000 000 000 000 00  | 100   100   101  | 200 000 00<br>200 000 00   |
| Forecasted   For   | -0.01 7.58 798 -0.01 6.13 5.29 429 0.00 9.70 7.88 0.00 0.00 1.54 1.58 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0   | 000 112 998<br>100-<br>100-<br>100-<br>100-<br>100-<br>100-<br>100-<br>100  | -001 633 518<br>000 806 668   | 000 000 000 000 000 000 000 000 000 00  | 0.00 6.54 80%<br>0.00 7.61 6.2%<br>0.00 7.51 6.2%<br>0.00 7.57 6.1%   | 000 229 285<br>000 414 389<br>000 038 79<br>000 028 79   | 000 5.19 428<br>000 5.37 429<br>000 249 209   | 000 1.65 138<br>0.00 6.38 519<br>0.00 9.14 7386   | 0.00 0.27 206<br>0.00 0.89 506<br>0.00 2.97 206   | .002 7.40 460<br>.003 679 540<br>.003 679 540   | 0.00 6.03 40%<br>0.00 2.23 6.0%<br>0.00 2.9 2.0%<br>0.00 6.54 77%   | -001 479 38%<br>-001 534 43%<br>-001 881 71%   | 0.00 6.04 area<br>0.00 3.79 3056<br>0.00 8.44 6695<br>0.00 7.76 6.256   | 0.00 867 6996<br>0.000 92.4 7494<br>-0.01 1.058 8594                                | 0.007 2.814 500-4<br>0.007 5.810 47%<br>0.007 8.818 71%<br>0.007 4.7.7 387%<br>0.007 S.77 469%  | 0.00 448 30%<br>-0.01 9.25 76%<br>-0.01 4.55 80%<br>-0.01 4.19 30%<br>-0.00 6.44 52%   | 000 4.77 388<br>-001 8.37 528<br>-001 8.37 528                                | 0.007 11.50 2558<br>0.007 3.88 3148<br>0.001 8.87 2148<br>0.001 9.2.2 5878<br>0.001 2.2.7 5878  | 0.00 1.02.2 2.0%<br>0.00 2.2.7 20%<br>0.01 6.7.9 60%<br>0.01 6.7.9 60%<br>0.01 10.0 87%<br>0.01 10.0 87%<br>0.01 10.0 87%<br>0.01 10.0 87%   | 000 011 000<br>000 011 000   |
| 100 (100 (100 (100 (100 (100 (100 (100   | 000 000 200<br>000 000 000<br>000 000<br>000 000<br>000 000<br>000 000<br>000 000<br>000 000<br>000 000  | 000 000 000   | 000 100 500-<br>000 800 500-<br>000 800 500-  | 000 100 100 100 100 100 100 100 100 100   | -0.04 0.03 0.00<br>-0.04 0.00 0.00<br>-0.03 0.00<br>-0.04 0.00  | 000 000 000 000 000 000 000 000 000 00   | 000 000 200-<br>000 000 200-  | 000 000 100·  | 000 000 000<br>100 000 000<br>200<br>200  | 000 000 000 000 000 000 000 000 000 00  | 000 100 400-<br>000 000 100-<br>000 000 100-  | 0000000  | 000 100 600-<br>000 200 200-<br>000 200 200-<br>000 200 200-  | 000 000 000   | 000 000 000<br>000 000 000<br>000 000 000<br>000 000<br>000 000<br>000 000  | 000 000 000<br>000 100 100<br>000 100 100<br>000 100 1   | 000 100 400-<br>000 000 500-<br>000 000 100-                                  | .000 000 000 000 000 000 000 000 000 00   |  |  |
| 2022   2023      | 800 000 000 000 000 000 000 000 000 000  | 00 000  | 000000  | 000 000 000 000 000 000 000 000 000 00  | 00  | 00 00 00   | 000 000 000   | 010- 000 00   | 00 000 000<br>00 000 000<br>00 000 000  | 000 000 000 000 000 000 000 000 000 00  | 00 000 000 000 000 000 000 000 000 000  | 00 000 000<br>00 000 000<br>00 000 000<br>00 000 000   | 0.00 0.00<br>0.00 0.00<br>0.00 0.00<br>0.00 0.00<br>0.00 0.00<br>0.00 0.00  | 000 000 000 000 000 000 000 000 000 00  | 000 000 00<br>110- 000 00<br>110- 000 00<br>100- 000 00<br>100- 000 00<br>100- 000 00   | 25th   0.0   0.00   0.01   | 00 00 100 00 00 831   | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 000 000 000 000 000 000 000 000 000 00   | 0.00 0.00 0.00<br>0.00 0.00<br>0.00 0.00   |
| For cost test   For cost tes   | C 9 9 9 9 9 9 9 9 9 9 9  | 000 111 000<br>001 0.01 000<br>000 0.01 0.00  | 000 612 600   | 000 000 000 000 000 000 000 000 000 00  | 0.00 0.20 800<br>0.00 7.68 62<br>0.00 7.14 999<br>0.00 7.61 611   | 100 300 500 600 100 100 100 100 100 100 100 100 1  | 0.00 5.29 426<br>0.00 1.91 1.66<br>0.00 5.52 458  | 000 1.67  | 0.00 2.93 2665<br>0.00 2.93 2665  | 200 2.447<br>200 2.447<br>200 2.447<br>200 2.447<br>200 2.447<br>200 2.447<br>200 2.447   | 0.00 6.75 275 475 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.   | 0.00 5.487 3996<br>0.00 5.44 489<br>0.00 8.78 7006<br>0.00 8.88 71%                              | 88888   | 000 000   | 0.00 2.91 9894<br>0.00 5.08 478<br>0.00 8.97 7284<br>0.00 8.97 208  | 0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.0  | 0.00 1.55 1.2%<br>0.00 4.93 4.0%<br>0.00 8.88 5.5%<br>0.00 9.30 64%           | .001 3.88 79%<br>0.00 3.81 31%<br>0.00 1.82 15%<br>0.00 8.02 20%<br>0.00 0.41 25%<br>0.00 7.22 00%  | (LO) 10.34 82%<br>(LO) 2.46 20%<br>(LO) 6.89 60%<br>(LO) 6.69 60%<br>(LO) 6.69 60%<br>(LO) 6.69 60%<br>(LO) 6.69 87%<br>(LO) 6.69 87%  | 900 117 000<br>900 127 000   |
| 000 000 000 000 000 000 000 000 000 00   | 000 000 000<br>000 000 000<br>000 000<br>000 000<br>000 000<br>000 000   | 000 000 000   | 000 000 000-<br>000 000 000-  | 11  | 0.00 0. | 000 WO 000-  | 000 000 000-<br>000 000-<br>000 000-  | 0.00 0. | 000 000<br>000 000<br>000 000   | 000 HGO HGO:  | 000 200 200-<br>000 100 100-<br>000 000 000-  | 000 000 000<br>000 000<br>000 000  | 000 100 100 100 100 100 100 100 100 100   | 000 000 000<br>000 000  | 000 000 000<br>000 000 000<br>000 000 000<br>000 000 000<br>000 000 000   | 0000000  | 000 000 000<br>000 000 000<br>000 000<br>000 000                              | 000 000 000<br>000 000 000<br>000 000 000<br>000 000 000  | MOT  | 00 00 00 00 00 00 00 00 00 00 00 00 00   |
| 1  |  | 1000 000 000 000 000 000 000 000 000 00   | 0.00  | 000 000 000 000 000 000 000 000 000 00  | 000000000000000000000000000000000000000   | 1  | 40% 0.0 -0.00 -0.00   | 1010   1000   1010       | 000 000 000   | 000 000 000 000 000 000 000 000 000 00  | 00 000 000 000 000 000 000 000 000 000  |  | 000 000 000 000 000 000 000 000 000 00  | 000 000   | 000 000 000 000 000 000 000 000 000 00  | Abs.         0.0         CM         0.0 <td></td> <td>000 000 000 000 000 000 000 000 000 00</td> <td>000 000 000 000 000 000 000 000 000 00</td> <td>000 000 000</td>   |   | 000 000 000 000 000 000 000 000 000 00  | 000 000 000 000 000 000 000 000 000 00   | 000 000 000  |
| 8 5 5  |  |   | 5.83 475<br>8.31 675  | 5.22 429<br>10.40 839<br>5.73 409<br>9.60 839   | 3.25<br>3.23<br>3.66  | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2  | 7 5.20 40%<br>9 1.99 16%<br>1 5.73 46%<br>2 2.73 22%  | 3 1.69 14%<br>5 6.53 5.2N<br>7 9.47 76%   | 2 2.65 200<br>3 2.55 200<br>4 2.55 200<br>4 2.55 200  | 7 7.52 478<br>8 8.91 718<br>9 6.95 568  | 2.23 523<br>2.23 428<br>3.21 208<br>5.05 805  |  | 6.20 550<br>3.84 311<br>6.78 70<br>2.67 218   | 2 8.89 715<br>2 9.36 756<br>4 10.63 859   | 7 2.93 9094<br>88 5.55 48%<br>90 5.19 47%<br>1 5.07 41%<br>3 5.70 40%   | 5 5 65 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9   | 1.56 1.78<br>5 5.18 4.78<br>7 8.88 5.68<br>9 9.88                             | 1 2.10 79%<br>3 1.75 20%<br>5 1.75 20%<br>5 1.75 11%  | 10.29 82%<br>9 2.46 2.46<br>1 6.69 6.75<br>2 8.71 82%<br>2 6.72 82%<br>6.73 82%<br>6.73 82%<br>6.73 82%<br>6.73 82%<br>6.73 82%<br>6.73 82%<br>6.73 82%<br>6.73 82%  | 2.10 67%<br>0 6.72 50%<br>1 6.19 50%   |
| 100    | 277 A21, 000<br>278 A21, 000<br>278 A21, 000<br>1116 A21, 001<br>1116 A21, 001<br>1119 A21, 001 | 310 2001<br>310 2001<br>310 2001<br>310 2001<br>310 2001<br>310 2001<br>310 2001<br>310 2001  | 388 0021,002<br>388 0021,002<br>1000 0021,002<br>399 0021,002   | 8 100 100 100 100 100 100 100 100 100 10  | 277 (201 001 001 001 001 001 001 001 001 001  | 748 7021 003<br>277 7021 004<br>278 7021 004<br>279 7021 004<br>702 703 7021 004<br>703 703 703 703<br>704 703 703 703 | 700 253 251 001 001 001 001 001 001 001 001 001 0   | 1288 001,000<br>1288 001,000<br>200 100<br>250 001,000<br>254 001,000<br>74 001,000   | 715 (201,000) 176 (201,000) 179 (201,000) 180 (201,000) 180 (201,000)   | 1117 AME 1000 1000 1000 1000 1000 1000 1000 10  | 777 2021 (0.07) 778 2021 (0.07) 779 2021 (0.07) 770 2021 (0.07) 770 2021 (0.07) 770 770 770 770 770 770 770 770 770 770   | 771 A01,078 777 A01,078 778 778 779 770 770 770 771 771 771 771 771 771 771                      | 900 2001 000 600 600 600 600 600 600 600 600  | 957 (001,007)<br>958 (001,007)<br>959 (001,007)<br>1440 (001,007)<br>1440 (001,007) | 1 445 A21 023 | 227 0021 002<br>228 0021 000<br>229 0021 000<br>220 000<br>22 | 760 2021_011 141 2021_011 148 2021_011 149 2021_011 149 2021_011 149 2021_011 | 707 2021 0127 0127 0127 0127 0127 0127 0  | 707 7021 0122 0121 0122 0121 0122 0121 0122 0121 0122 0121 0122 0121 0122 0121 0122 01   | 409 (202) (212) (212) (213) (2 |
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| of dency Defidency<br>DA(%) 2025 (%)   |   |   |  |  |   |   |   |  |   |   | Ш  | Н   |   | H   |   |  |  |   |   |   |                              |  |   |   |   |   |   |  |  |   | jë.   |
|--|---|---|--|--|---|---|---|--|---|---|--|---|---|---|---|--|--|---|---|---|------------------------------|--|---|---|---|---|---|--|--|---|---|
| Deficiency (%)   |   |   |  |  |   |   |   |  |   |   |  | H   |   |   |   |  |  |   |   |   |                              |  |   |   |   |   |   |  |  |   |   |
| odiciency Deficiency<br>sizs (nww) assi (16)   |   |   |  |  |   |   |   |  |   |   |  |   |   |   |   |  |  |   |   |   |                              |  |   |   |   |   |   |  |  |   | 7000  |
| clercy (IAM)  223 (IAM) 2024 (IAM) 3   |   |   |  |  |   |   |   |  |   |   |  |   | H   | H   |   |  |  |   |   |   |                              |  |   |   |   |   |   |  |  |   |   |
| Deficiency Deficiency D  |   |   |  |  |   |   |   |  |   |   |  | Н   | Н   | H   |   |  |  |   |   |   |                              |  |   |   |   |   |   |  |  |   |   |
| 10 DAMO ESPANO 2<br>01 DAMO ESPANO 2<br>02 0.000 0.000<br>04 0.000 0.000   | 200 000 000 000 000 000 000 000 000 000   | 11 000 000<br>11 000 000<br>11 000 000  | 337 0000 0000<br>348 0000 0000<br>349 0000 0000<br>349 0000 0000   | 000 000 000 000 000 000 000 000 000 00                             | 111 0000 0000<br>222 0000 0000<br>115 0000 0000<br>1000 0000  | 000 000 00<br>000 000 00  | 000 000 00<br>000 000 00<br>000 000   | 19 0.00<br>00 0.00<br>00 0.00  |   | 000 000 00                                      | 25 000 000                                     | 000 000 00                                    | 200 - 000 00  | 000 000 000   | 000                                     | 24 0.00 -0.00<br>24 0.00 -0.00<br>29 0.00                  | 23 0.00 0.00<br>36 0.000 0.002<br>16 0.000 0.000   | 000 000 000   | 200 000 000 000 000 000 000 000 000 000   | 23 000 -0.03<br>23 000 -0.03<br>05 000 -0.03  | 000 0000 000                 | 110<br>100<br>100<br>100<br>100<br>100<br>100<br>100<br>100<br>100   | 000 000 000<br>000 000 000<br>000 000 000<br>100 000 0  | 200 000 000   | 000 000 00  | 000 000   | 000 -000<br>12 000 -003<br>04 000 -001  | 000 000 000                                    | 17 000 0.00<br>000 000<br>000 000                                    | 13 000 000  | 22 0.001 0.003<br>22 0.001 0.003<br>23 0.001 0.003<br>24 0.001 0.003  |
| 1025<br>107 (107 (107 (107 (107 (107 (107 (107 (   | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 0.00 0.015 0.000 0. | 0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.0  | 0                            | 0 000 000   | 0 000 000   | 0.00 0. | 0.00 -0.17 1.  |   | 0 000 000                                       | 0.000 -0.17 0.000 0.000                        | 0.00 -0.13 0.00 0.00 0.00 0.00 0.00 0.00 0.00 | 0.05 -0.09 0.   | 0.028 0.015 0.000 0.001 0.001                                     |   | 0.00 0.00 0.24   | 0.00 0.023 0.000 0.000 0.000 0.000   | 0.00 0. | 0 010 010 0   | 0.00 0.019 0.000 0. | 0.001 0.009 0.009            | 0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000<br>0.000  | 0 000 0   | 0.00 0.017 0.000 0. | 0 000 000   | 0 110- 200-   | 0.000 0.000   | 0.001 0.004 0.004                              | 0 000 000  | 000 | 0.000 0 |
| 8 ase Resident No. Demond at PV R. Demond at DV R. Demond at D | 1000 000 000 000 000 000 000 000 000 00   | 000 000   | 000 000 000 000 000 000 000 000 000 00   | 000000000000000000000000000000000000000                            | 000 | 000 000<br>000 000<br>00 000<br>00 000  | 000 000 %   | 3, 0.19 0.01   |   | 000 000 90                                      | 0.43 0.00                                      | PS 0.05 0.10                                  | 34 0.09 0.00  | 000 000 000   |   | 17% 0.02 0.00<br>17% 0.09 0.00<br>85% 0.00 0.01            | 0.70 0.00<br>00.00 0.00<br>00.00 0.00  | 000 000<br>00 000<br>00 000<br>00 000   | 000 000<br>000 000<br>000 000   | 0.00 0.00<br>0.23 0.00<br>0.01 0.12   | 0000 0000                    | 000000000000000000000000000000000000000  | 000 000<br>000 000<br>000 000<br>000 000<br>000 000   | 98 0.09 0.00<br>98 0.15 0.00  | 000 000<br>000 000<br>000 000   | 000 000<br>000 000<br>000 000   | 35 0.11 0.06<br>35 0.11 0.06<br>36 0.08   | 108 0.05                                       | 000 000<br>000 000<br>000 000  | 34 0.23 0.00<br>0.23 0.00<br>0.39 0.14  | NI 0.27 0.00<br>NI 0.05 0.00<br>NI 0.05 0.41  |
| forecasted Fazilty<br>Devend (soding<br>00 MW) (sq. 131 41<br>00 8.18 60<br>00 7.40 59   |   | 00 788 60<br>00 651 50<br>00 935 75   | 23 23 23 23 23 23 23 23 23 23 23 23 23 2   | 410<br>410<br>410<br>410<br>410<br>410<br>410<br>410<br>410<br>410 | 533<br>533<br>533<br>533<br>533<br>533<br>533<br>533<br>533<br>533  | 20 22 20 20 20 20 20 20 20 20 20 20 20 2  | 01 195 16<br>04 7.63 61<br>03 5.90 47   | 01 512 42  |   | 00 867 70<br>00 378<br>00 378                   | 01 12.98 Se<br>02 5.57 66                      | 00 403<br>07 878 00                           | 01 637 SI<br>01 919 74  | 03 7.90 63<br>02 4.20 40<br>00 054 2                              |   | 813<br>422<br>852  | 02 10.19 82<br>02 9.23 74<br>01 2.80 22  | 00 0 188<br>00 445<br>00 705<br>00 188  | 00 00 00 00 00 00 00 00 00 00 00 00 00  | 00 603 48<br>00 857 89<br>02 670 34   | 23 33 0 N                    | 000 3228<br>000 4028<br>010 6887<br>02 6887<br>02 6887<br>03 6887<br>03 6887<br>04 6887<br>05 | 20 12 281 78<br>20 10 60 86<br>20 10 60 86<br>20 10 86<br>20 | 00 935 77   | 20 110 20 20 20 20 20 20 20 20 20 20 20 20 20   | 00 900 72<br>00 1126 90   | 02 881 71<br>02 1027 82<br>01 479 88  | 05 626 50<br>02 820 66                         | 20 (00 k1                        | 77.3 77.00 14.5 11.00 11. | 00 1064 78<br>01 660 53<br>02 1333 107<br>02 1001 80  |
| 0 000 0 000 0 000 0 0 0 0 0 0 0 0 0 0  |   | 0.000 000   | 0.000 0  | 0.0000000000000000000000000000000000000                            | 0.000 0 | 0.00  | 0.000 000 000   | 0- 000 000   |   | 0 000 000                                       | 0.21 0.00 0.0                                  | 0- 000 000                                    | 0.000 0.00  | 0.000 000 0   | 8                                       | 0.20 0.00 -0.00  | 0.00 0.00<br>0.10 0.00<br>0.12 0.00  | 0 000 000   | 0.00 0. | 0.000 0.00  | 0.00 0.00                    | 000  | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  | 0.000 0 | 0.000 000 000   | 0.000 0 | 0.00 0.00   | 0.000 1000                                     | 0 000 000  | 0.000 0.000   | 0.000 0 |
| 2028 Nan- Red den tiel Red den  | 8 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | 910- 100-<br>210- 000<br>210- 000   | 000<br>000<br>000<br>000<br>000<br>000<br>000<br>000   | 000000000000000000000000000000000000000                            | 000<br>000<br>000<br>000<br>000<br>000<br>000<br>000<br>000   | 000 -013  | 0.00 0. | 000 -014   |   | 0003 0009                                       | 0.00 013                                       | 000<br>000                                    | 0.03 -0.10  | 0.00 0.00   |   | 000 000  | 0.05 0.08  | 000 000   | 000<br>000<br>010<br>010<br>000   | 000 015   | 0.00                         | 000<br>000<br>000<br>000<br>000<br>000<br>000<br>000<br>000  | 800- 000<br>800- 000<br>800- 000  | 000 013   | 000 000   | 100-100-  | -0.01 -0.06   | 1000 1000                                      | 000 -013   | 000 018   | 0.00 0.026  |
| 8-000 Resident<br>Contract of Put<br>200 DAVIO DAVIO<br>420 DO DO<br>550 D.10 DO<br>550 D.10 DO  | 000 000 000 000 000 000 000 000 000 00  | 200 000 000<br>480 000 000<br>480 000 000   | 25N 0.00<br>42N 0.00<br>62N 0.00<br>72N 0.00<br>72N 0.00<br>72N 0.00<br>72N 0.00   | 010 010 010 010 010 010 010 010 010 010                            | 900 000 000 000 000 000 000 000 000 000   | 000 000 968   | 588 0.00 000<br>588 0.19 000<br>489 0.00 000  | 200 000 42H  |   | 315 0.00 0.00<br>30% 0.00 0.00<br>30% 0.00 0.00 | 528 0.19 0.00<br>619 0.49 0.00                 | 210- 200 SIZ                                  | 209 0.05 -0.05<br>74% 0.00 0.00   | 401 0.00 0.00<br>401 0.00 0.00                                    | 8                                       | 7466 0.009 -0.002<br>1776 0.002 0.000<br>8596 0.002 -0.001 | 79% 0.18 -0.20<br>72% 0.26 -0.21<br>21% 0.10 0.00  | 200 000 000<br>35% 0.00 000   | 000 000 000 000 000 000 000 000 000 00  | 900 000 968<br>900 900 968<br>900 000 900   | 200 0.01 0.00                | 2354 0.00<br>2375 0.00<br>275 0.00<br>2  | 7294 0.05 -0.00<br>3794 0.09 0.00<br>4894 0.01 0.00<br>7254 0.09 0.00   | 769 0.00 0.00<br>779 0.06 0.00  | 715 0.00 -0.00 825 825 8.00 9.00 9.00 9.00 9.00 9.00 9.00 9.00  | 728 0.00 0.00<br>718 0.00 0.00<br>888 0.12 0.00   | 70% 0.0% 0.0%<br>80% 0.2% 0.0%<br>39% 0.3% 0.0%   | 450, 0.47 -0.05<br>619, 0.39 -0.07             | 60% 0.10 -0.00<br>215 0.00 0.17<br>-0.00 0.13                        | 77% 0.06 0.00<br>10% 0.09 0.00<br>908 0.16  | 778 0.01 0.00<br>5596 0.00 0.00<br>978 0.00 0.01  |
| Fore cisted Fostly (2007) (200 | 000000000000000000000000000000000000000   | 0.00 7.77   | 315<br>0.001<br>3.15<br>0.002<br>5.25<br>0.002<br>5.25<br>0.002<br>5.25<br>0.002<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003<br>0.003 | 0000 419<br>0000 810<br>0000 810                                   | 0000 8881   | 0.02 7.03   | 0.03 7.22   | 0.00 5.15  |   | 0.00 8.69                                       | 0.01 12.74<br>0.01 4.94                        | 0.03 4.96                                     | 0.00 9.21   | 0.00 4.15   |   | .003 8.65  | 0.01 9.81<br>0.01 8.96<br>0.01 2.65  | 0.00 1.79   | 0.00 8.22   | 000 600   | 0.00                         | 000 3.28<br>000 4.09<br>001 5.80<br>0.01 6.79<br>0.01 8.59   | 7.75<br>0.001 6.81<br>1.74<br>0.001 6.00  | 0.00 9.27   | 0.00 8.67   | 0.03 8.89   | 0.00 8.75   | 0001 2550                                      | 000 607  | 000 7.67  | 0.00 10.50<br>0.001 6.58<br>0.001 12.18   |
| UADR 0 000 000 000 000 000 000 000 000 000   | 0000 0000 0000 0000 0000 0000 0000 0000 0000  | 000 000   | 0.00 0.  | 000000000000000000000000000000000000000                            | 000000000000000000000000000000000000000   | 0.00 0.00   | 0.01 0.00   | 000 000  |   | 000 000   | 0.00 0.00                                      | 0.05 0.00                                     | 000 000   | 1000 2000   | 500                                     | 0.16 0.00  | 000 000  | 000 000   | 000 000   | 0.09 0.00   | 000 000                      | 0000 0000 0000 0000 0000 0000 0000 0000 0000   | 000   | 0.00 0.00   | 000 000 000 000   | 0.00 0.00   | 0.00 0.00   | 000 900  | 000 000  | 000 000<br>000 000  | 0.14 0.00 0.01 0.00 0.00 0.00 0.00 0.00   |
| 2023<br>Nan-<br>Red dontal<br>P V (NAN)<br>0 0.00 0.00   | 11 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | 000 | 100 000 00 000 00 000 000 000 000 000 0  | 000000000000000000000000000000000000000                            | 3 .002 .003<br>4 .003 .003<br>4 .003 .003   | 000 000   | 0 0.00 0.00   | 0.00 0.10  |   | 000 000 000 000 000 000 000 000 000 00          | 000 000 0                                      | 000 -008                                      | 0 -0.08 -0.07   | 0 000 000   | e e                                     | 0.00 0.00  | 0.00<br>0.00<br>0.00<br>0.00<br>0.00   | 2 000 000   | 010-010-000   | 2 0.00 0.00<br>0.00 0.00<br>0.010 0.12  | 0.00 0.00                    | 000000000000000000000000000000000000000  | 00 000 000<br>000 000<br>000 000<br>000 000   | 010 000 010   | 7 - 0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.  | 0.001 0.001 0.005 0 | 0.001 0.004<br>5 0.007 0.005<br>2 0.001 0.003   | 0.001 0.002                                    | 000 000 000  | 0 000 011   | 00 000 000  |
| 9 See Resident 4 PV (SEE ONL) (SEE O | 00 00 00 00 00 00 00 00 00 00 00 00 00  | 200 000 000 000 000 000 000 000 000 000   | 200 000 000 000 000 000 000 000 000 000  | 200 00 00 00 00 00 00 00 00 00 00 00 00                            | 2008 000 000 000 000 000 000 000 000 000  | 00 00 948   | 17% 0.0 0.0<br>56% 0.0 0.0<br>49% 0.0 0.0   | 87% 0.0 0.0<br>42% 0.0 0.0   |   | 3006 0.00 0.00                                  | 281 0.0 0.0                                    | 715 0.0 0.0                                   | 788 0.0 0.0   | 0 00 100  | 00                                      | 275 0.0 0.01<br>175 0.0 0.00<br>845 0.0 0.01               | 785 0.0 0.<br>714 0.0 0.<br>20% 0.0 0.0  | 200 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0   | 000 000 000   | 900 00 00<br>900 00 00<br>900 00 00   | 25% 0.0 0.0                  | 2394 0.00 0.1<br>3395 0.00 0.0<br>4005 0.00 0.0<br>5405 0.00 0.0   | 355 0.0 0.0<br>375 0.0 0.0<br>375 0.0 0.0<br>375 0.0 0.0<br>375 0.0 0.0   | 200 000 000<br>200 000 000  | 275<br>200<br>200<br>200<br>200<br>200<br>200<br>200<br>200<br>200<br>20  | 728 0.0 0.0   | 70% 0.00 0.0<br>72% 0.00 0.0  | 00 000 Ness                                    | 0 00 900   | 200 000<br>200 000<br>200 000   | 55% 0.00 0.0<br>55% 0.00 0.0<br>55% 0.00 0.0<br>77% 0.00 0.0  |
| Fercested Foots Orman Density (1994)   | 000<br>000<br>000<br>000<br>000<br>000<br>000   | 000 720 000 000 000 000 000 000 000 000   | 0001 829<br>0001 824<br>0001 827<br>0001 827<br>0001 828   | 000 733<br>000 733<br>000 733<br>000 738                           | 000 506<br>000 546<br>001 828<br>001 828  | -001 771<br>-001 764<br>-001 1044   | -0.00 2.03<br>-0.02 6.93<br>0.00 6.13   | 000 1090<br>000 519  |   | 000 393<br>000 871<br>000 379                   | .001 1254<br>.001 448                          | -002 500                                      | 000 924   | 000 806<br>-001 413<br>000 053                                    |   | -007 730<br>-001 413<br>-001 838                           | -0.01 9.75<br>-0.01 88.2<br>0.00 2.5.4   | 000 449   | 000 807   | -001 602<br>-001 835  | 868 000                      | 000 327<br>000 412<br>001 578<br>001 675<br>001 675  | 001 573<br>000 174<br>000 174<br>001 599  | 0.00 920  | 0001 8888<br>0001 10067<br>0001 775   | 001 500   | 001 873<br>001 977  | -001 504                                       | -001 603<br>-001 603   | 000 123   | 001 1042<br>001 658<br>001 1116   |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0   | 000 | 000 | 00 000 000 000 000 000 000 000 000 000   | 0000 0000 0000 0000 0000 0000 0000 0000 0000                       | 0000 0000 0000 0000 0000 0000 0000 0000 0000  | 000 | 0.00 0.00 0.00  | 000 000 000  |   | 000 000 10                                      | 000 0111 0.00                                  | 000 000 000                                   | 000 000 000   | 000 000 000   | 80                                      | 000 070 000  | 000 000 000  | 000 000 000   | 000 | 000 000 000   | 000 000 90                   | 000  | 000   | 000 000   | 000 | 000 000 000   | 000 | 000 000 000                                    | 000 000 000  | 000 000   | 000 000 000 000 000 000 000 000 000 00  |
| 282  | 000 000 000 000 000 000 000 000 000 00  |   | 0: 000 000 000 000 000 000 000 000 000   | 9181818181   | 9 10 9 9 9  | 0- 100- 000-  | 0.00 0.00 0.00 0.00 0.00 0.00   | 0.00 0.00  |   | 0.000 000                                       |  | 0- 000 000                                    | 0.00 -000 -000  | 0.000 0000 0000   | 100                                     | 0.000 000  | 0.00 000 0   | 0.000 000 000   | 000 000   | 0.000 0 | 0.00 000                     | 0.000 0  | 0- 000 000<br>0- 000 000<br>0- 000 000<br>0- 000 000  | 000 000   | 0 000 000   | 0.000 000 000   | 0.000.000.000   | 0.000 50.0                                     | 0- 500- 500-   | 0.00  | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0  |
| 866  | 000 000 000 000 000 000 000 000 000 00  | 000 000<br>9694 000<br>9695 000   | 258 0.0<br>418 0.0<br>625 0.0<br>828 0.0   | 00 00 00 00 00 00 00 00 00 00 00 00 00                             | 9008<br>9008<br>9008<br>900<br>900<br>900<br>900<br>900<br>900<br>9   | 629<br>629<br>639<br>609<br>609   | 17% 0.0<br>56% 0.0<br>51% 0.0   | 45% 0.00 0.00  |   | 32% 0.0<br>70% 0.0<br>31% 0.0                   | 500 00 000<br>500 00 000                       | 41% 0.0<br>72% 0.0                            | 300<br>740<br>740<br>740<br>740<br>740<br>740<br>740<br>740<br>740<br>7 | 000 800s<br>100s  | 00                                      | 1256<br>1006<br>8376<br>0.00                               | 79% 0.0<br>71% 0.0<br>20% 0.0  | 360 0.0<br>360 0.0<br>6006 0.0  | 000 000<br>000 000<br>000 000   | 898 0.0<br>878 0.0  | 2504 0.0                     | 2258 0.00<br>3278 0.00<br>4875 0.00<br>5465 0.00   | 785 0.0<br>375 0.0<br>485 0.0<br>725 0.0  | 758 0.0<br>758 0.0<br>269 0.0   | 72% 0.0<br>80% 0.0<br>80% 0.0   | 73% 0.0<br>71% 0.0<br>88% 0.0   | 70% 0.0<br>79% 0.0<br>32% 0.0   | 415<br>5881<br>00<br>5881                      | 715 000  | 0000  | 25% 0.0<br>80% 0.0<br>80% 0.0   |
| Forested Factorial Factori | 100 627<br>100 673<br>100 673<br>100 673  | 000 2.78  | 000 297 000 000 000 000 000 000 000 000 000 0  | 000  | 000   | 0.01 7.75   | 0.00 2.09   | 0.00 5.23  |   | 0.00 8.73                                       | 000  | -0.01 5.07                                    | 0.00 6.29   | 0.00 8.16   | 100                                     | 0.00 4.09  | 0.00 9.88  | 0.00 4.51   | 0000  | 0.00 6.05   | 000 408                      | 0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.0  | 000 2.77<br>000 6.78<br>000 000<br>000 000  | 0.00 10.23  | 000 894   | 0.00 8.83   | 000 875   | 000 208  | -0.01 6.09   | 888   | 0.00 10.45<br>0.00 6.65<br>0.00 10.71   |
| 000 000 000 000 000 000 000 000 000 00   | 88888   | 000 EUO EUO<br>000 EUO EUO<br>000 EUO   | 000 000 000<br>000 000 000<br>000 000 000<br>000 000 000   |  | 000 | 000 000 000   | 000 000 000<br>000 000 000  | 000 000 000  |   | 000 000 000 000                                 | 0.03 0.03                                      | 000 000 000                                   | 000 000 000   | 000 000 000   |   | 001 001 000<br>003 003 000                                 | 000 000 000<br>000 000 000<br>000 000 000  | 000 000 000   | 000 000 000   | 003 003 000<br>003 003 000<br>004 004 000   | 000 000 000                  |  | 003 003 000<br>000 000 000<br>000 000 000<br>000 000  | 000 000 000<br>000 000 000<br>000 000 000   | 000 000 000<br>000 000 000  | 000 000 000   | 0.01 0.01 0.00<br>0.02 0.00<br>0.01 0.01 0.00   | 000 000 000                                    | 001 001 000<br>003 003   |   | 0.00 0.00 0.00<br>-0.00 0.00 0.00<br>-0.00 0.00   |
| 20<br>don-<br>eside-<br>ry OAV   | 8888  |   |  | 88888  | 000000000000000000000000000000000000000   | 1000  | 0.03  | 20.00  |   | 1000  | 000  | 000   | 00 000  | 0000  |   | 100  | 000  | 000 000   | 88888   | 000   | 10.0                         | 000 000 000 000 000 000 000 000 000 00   | 000 000 000   | 000000000000000000000000000000000000000   | 1000  | 000000000000000000000000000000000000000   | 000   | 1000   | 200- 000   |   | 0.00  |
| 8999 Bersh (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)   | 000 000 000 000 000 000 000 000 000 00  | 0 00 564<br>0 00 564<br>0 00 569<br>0 00 569  | 23% 0.0 0.0 41% 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.   | 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                             | 90% 000 000 000 000 000 000 000 000 000   | 0.00 809  | 1896 0.0 0.00<br>1876 0.0 0.00<br>1878 0.0 0.00   | 85M 0.0 0.00<br>45M 0.0 0.00   |   | 32% 0.0 0.00<br>31% 0.0 0.00<br>31% 0.0 0.00    | 0 00 1685<br>0 00 1685                         | 72% 0.0 -0.09                                 | 518 0.0 -0<br>758 0.0 0.0   | 415 0.0 0   | 00                                      | 2758 0.00 -0.00 100 0.00 100 0.00 0.00 0.00                | 20% 0.0 -0.<br>72% 0.0 -0.<br>20% 0.0 0.0  | 200 00 00<br>200 00 0<br>600 00 0   | 0.000 000 000 000   | 000 998   | 2596 0.00 0.0                | 2000 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0   | 7895 0.0 -0<br>7895 0.0 0.0<br>8995 0.0 0.0<br>4995 0.0 0.0<br>7256 0.0 0.0   | 200 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0   | 72% 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.  | 73% 0.0 -0.<br>71% 0.0 0.0<br>88% 0.0 -0.   | 70% 0.0 -0.0<br>79% 0.0 -0.0<br>32% 0.0 0.0   | 418 0.0 ·0.0 S994 0.0                          | 218 Q.0 Q.00<br>218 Q.0 Q.00<br>238 Q.0 Q.00                         | 000   | 77% 0.00 0.00   |
| Forecasted Fockly Convents (Section 1974) Condense (Se | 0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.0   | 88.25.38  | 202 203  | 2                            | 888888  | 72 7.80<br>N 7.66<br>N 7.66   | 77 2.20<br>78 6.80<br>79 6.51   | 11<br>22<br>33 10.56 85%<br>34 5.27 43%<br>55                                | 2000  | 3.98 3.09<br>3.87 706<br>3.82 3.87<br>3.82 3.18 | 2021_0195<br>2021_0197 12.51<br>2021_0197 4.58 | 20 5.14<br>21 8.98                            | 88 63   | 22 8.27<br>20 4.23<br>11 0.52                                     | 202                                     | 15 7.7M<br>17 8.30   | 10.02<br>21 8.97<br>22 2.51  | 17.1 4 5.2  | 2.00  | 31 6.08<br>32 8.48<br>33 7.16   | 413                          | 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3  | 23 7.80<br>6.78<br>6.04<br>77 8.96<br>8.96<br>8.96<br>8.96<br>8.96<br>8.96<br>8.96<br>8.96  | 80 10.25<br>00 9.23<br>00 8.26  | 20 E E E E E E E E E E E E E E E E E E E  | 20 9.09<br>27 10.99   | 8.77<br>90 8.77<br>11 4.01  | 732  | 27 6.33<br>29<br>20<br>21 6.15<br>22 10.96                           | 23<br>25<br>25<br>25<br>25<br>25<br>25<br>25<br>25<br>25<br>25<br>25<br>25<br>25  | 77 10.44<br>78 0.89<br>10.29<br>11.29<br>11.  |
| 24A,10 Facility E<br>201,103<br>201,103<br>201,103   | 2021 01450<br>2021 01467<br>2021 01467<br>2021 01467<br>2021 01507<br>2021 01507<br>2021 01507  | 001 010<br>001 010<br>001 010<br>001 010  | A211 0155<br>A211 0157<br>A211 0159<br>A211 0160<br>A211 0160  | 2021 011<br>2021 011<br>2021 016<br>2031 016                       | 2021 0167<br>2021 0168<br>2021 0170<br>2021 0170<br>2021 0170<br>2021 0170  | 10 1202   | 2021_0177<br>2021_0178<br>2021_0179<br>2021_0180  | AULI USS<br>AULI USS<br>AULI USS<br>AUZI USS<br>AUZI USS                     | 2021 01.<br>2021 01.<br>2021 01.<br>2021 01.<br>2021 01.                      | 10 1200<br>10 1200<br>10 1200<br>10 1200        | 100 1200<br>100 1200<br>100 1200<br>100 1200   | 10 1000<br>200 1000<br>200 1000               | 0021_002<br>0021_003<br>0021_004<br>0021_005                            | 300, 200<br>300, 200<br>300, 200<br>300, 00<br>300, 00<br>300, 00 | 20 100<br>100 100<br>100 100<br>100 100 | 0021_02<br>0021_02<br>0021_021<br>0021_021                 | 200 1000   | 200 1000  | 2021 022<br>2021 022<br>2021 023  | 2001 000<br>2001 000<br>2001 000<br>2001 000  | 2021 025                     | 202, 1200<br>202, 1200<br>202, 1200<br>203, 1200<br>203, 1200<br>203, 1200   | 0 1000<br>0 1000<br>0 1000<br>0 1000<br>0 1000  | 0021 008<br>0021 008<br>0021 008  | 20 1200   | 2021 025<br>2021 025<br>2021 025  | 0021_026<br>0021_026  | 20 1000<br>20 1000<br>20 1000<br>20 1000       | 2021 000<br>2021 000<br>2021 000<br>2021 000<br>2021 000<br>2021 000 | 2021 024<br>2021 024<br>2021 024  | 0021_007<br>0021_007<br>0021_007<br>0021_007<br>0021_007  |
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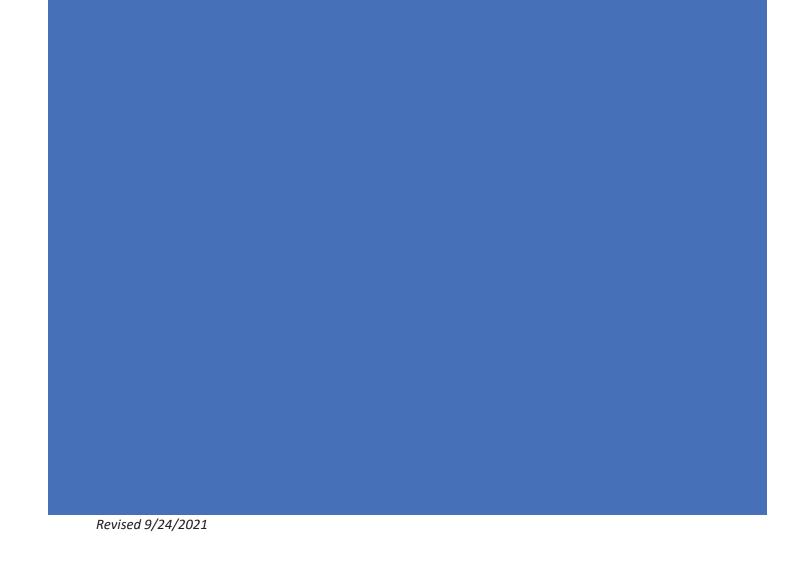
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| Appairement      | Surreption   | Boulder Cross Boulder Cross Boulder Cross Correspon Corr   | London London  Matterny  | Ocean Drivers Ocean Barris Ocea | Core horn Core h | Sector Marcoral Ma |

| Ci sellinori  |                 |           |                                      |   | Anticipated     |                      |        |                                |         |  |               |                      |          |                        |            |            |                        |
|---|-----------------|-----------|--------------------------------------|---|-----------------|----------------------|--------|--------------------------------|---------|--|---------------|----------------------|----------|------------------------|------------|------------|------------------------|
|   |                 |           | Distribution<br>Service Identified P | Distribution Service Identified   Primary Driver of Grid Need   1 | Upgrade<br>Date | Facility Type t      | Rating | rquipme Deric<br>nt Units 2021 | 21 2022 | Equipmen Equipme Deniciency Denic | cy Deficiency | / Deficiency<br>2025 | 2021 (%) | Deficiency<br>2022 (%) | 2023 (%) 2 | 2024 (%) 2 | Deficiency<br>2025 (%) |
| GNA_2021_0001 2021_0209   | Border          | 536       | Thermal, Backtie                     | Demand Growth, DER Growth   | 6/1/2022        | Distribution Line    |        | MW                             |         |  |               |                      |          |                        |            |            |                        |
| GNA_2021_0002 2021_0279   | San Ysidro      | 1202      | Thermal                              | Demand Growth, DER Growth   | 6/1/2025        | Distribution Line    | 12.47  | MW                             |         |  |               | 0.86                 |          |                        |            |            | 2%                     |
| GNA_2021_0003 2021_0405   | El Cajon        | 549       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Line    | 12.47  | MW                             | 0.44 0. | 0.17   |               |                      | 4%       | 1%                     |            |            |                        |
| GNA_2021_0004 2021_0475 Spring Valley   | pring Valley    | 730       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Line    | 12.47  | MW                             | 0.36 0. | 0.37 0.37  | 0.4           | 0.44                 | 3%       | 3%                     | %8         | 3%         | 4%                     |
| GNA_2021_0005 2021_0533 North City West   | rth City West   | 832       | Thermal, Backtie                     | Demand Growth, DER Growth   | 6/1/2025        | Distribution Line    | 12.47  | MW                             |         |  |               | 0.02                 |          |                        |            |            | %0                     |
| GNA_2021_0006 2021_0635   | Chicarita       | 502       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Line    | 12.47  | MW                             |         |  | 0.03          | 0.17                 |          |                        |            | %0         | 1%                     |
| GNA_2021_0007 2021_0902   | Jamacha         | JM30      | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Line    | 30     | MVA                            | 0.59 0. | 0.47 0.48  | 0.55          | 99.0                 | 7%       | 7%                     | 7%         | 7%         | 7%                     |
| GNA_2021_0008 2021_0982 St  | Spring Valley   | 730       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 3.74   | MW                             | 1.21 1. | 1.21 1.21  |               |                      | 32%      | 32%                    | 32%        |            |                        |
| GNA_2021_0009 2021_0983   | Chicarita       | 205       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 10.39  | MW                             | 0.83    | 0.85 1.00  |               |                      | %8       | %8                     | 10%        |            |                        |
| GNA_2021_0010 2021_0984   | Apline          | 356       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment |        | MW                             |         |  |               |                      |          |                        |            |            |                        |
| GNA_2021_0011 2021_0985   | Jamacha         | 95        | Thermal, Backtie                     | Thermal, Backtie Demand Growth, DER Growth                        | 6/1/2022        | Distribution Segment | 10.39  | MW                             | 0.85 0. | 0.87 0.87  |               |                      | %8       | %8                     | %8         |            |                        |
| GNA_2021_0012 2021_0986   | Santee          | 396       | Voltage                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment |        | Npu                            | 0.00    | 0.00 0.00  |               |                      | 0.04%    | 0.04%                  | 0.02%      |            |                        |
| GNA_2021_0013 2021_0987   | Ash             | 450       | Thermal, Backtie                     | Thermal, Backtie Demand Growth, DER Growth                        | 6/1/2022        | Distribution Segment | 11.02  | MW                             | 0.21 0. | 0.21 0.21  |               |                      | 7%       | 7%                     | 7%         |            |                        |
| GNA_2021_0014 2021_0988 S   | San Marcos      | 1094      | Thermal, Backtie                     | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 10.39  | MW                             | 0.27 0. | 0.27 0.42  |               |                      | 3%       | 3%                     | 4%         |            |                        |
| GNA_2021_0015 2021_0989 C   | Clairemont      | 277       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 3.74   | MW                             | 0.04 0. | 0.06 0.08  |               |                      | 1%       | 7%                     | 7%         |            |                        |
| GNA_2021_0016 2021_0990   | Scripps         | 437       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 2.70   | MW                             | 0.35 0. | 0.35 0.35  |               |                      | 13%      | 13%                    | 13%        |            |                        |
| GNA_2021_0017 2021_0991   | Mission         | 701       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 2.70   | MW                             | 0       | 0.02 0.02  |               |                      |          | 1%                     | 1%         |            |                        |
| GNA_2021_0018 2021_0992 C   | Clairemont      | 276       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 2.70   | MW                             | 0.08    | 0.10 0.10  |               |                      | 3%       | 4%                     | 4%         |            |                        |
| GNA_2021_0019 2021_0993 T   | Torrey Pines    | 266       | Thermal                              | Demand Growth, DER Growth   | 6/1/2022        | Distribution Segment | 12.06  | MW                             |         | 0.15   |               |                      |          |                        | 1%         |            |                        |
| Confidential information is highlighted in black and redacted Revised 9/24/2021 | ighted in black | and redac | ted                                  |   |                 |                      |        |                                |         |  |               |                      |          |                        |            |            |                        |

### 2021 Distribution Deferral Opportunity Report of San Diego Gas & Electric Company

## 2021 DISTRIBUTION DEFERRAL OPPORTUNITY REPORT OF SAN DIEGO GAS & ELECTRIC



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### 1. Purpose

San Diego Gas and Electric (SDG&E) hereby submits its 2021 Distribution Deferral Opportunity Report (DDOR) in compliance with Ordering Paragraph (OP) 2.d of Decision (D.) 18-02-004 (Decision), the Administrative Law Judge's Ruling issued May 7, 2019 (May 2019 Ruling), the Administrative Law Judge's Ruling issued May 11, 2020 (May 2020 Ruling), revised Attachment A submitted by the ALJ on June 12, 2020 and further revised on August 11, 2020, and the Administrative Law Judge's Ruling issued June 21, 2021.

### Background 2.

On February 15, 2018, the California Public Utilities Commission (Commission or CPUC) issued the Decision on Track 3 Policy Issues, Sub-track 1 on Growth Scenarios and Sub-track 3 on Distribution Investment Deferral Framework. This Decision directed the Investor-Owned Utilities (IOUs or utilities) to file a Grid Needs Assessment (GNA) by June 1 of each year and a Distribution Deferral Opportunity Report (DDOR) by September 1 of each year (included with this Report as Appendix A). The May 2019 Ruling directed the IOUs to provide additional GNA/DDOR reporting requirements and moved the annual filing date for the GNA and DDOR to August 15.<sup>2,3</sup>

The DDOR is intended to provide stakeholders with an overview of each IOU's new planned investment(s) to address needs identified in the GNA and serves as the basis for discussions with the Distribution Planning Advisory Group (DPAG). Those discussions are intended to help identify and prioritize candidate projects that can be deferred by cost-effective Distributed Energy Resources (DER) procured via the Commission-approved Competitive Solicitation Framework (CSF).

### 3. Executive summary

SDG&E's 2021 DDOR is for the 2021–2025 five-year distribution planning period and provides an overview of twelve (12) planned investments associated with the nineteen (19) verified needs identified in the 2021 GNA. As a result of applying the initial screening criteria to identify preliminary candidate deferral opportunities (i.e., technical and timing screens), SDG&E has identified two (2) potential candidate projects for deferral by cost-effective DER in SDG&E's 2021-2022 DIDF cycle. SDG&E will review the results of this initial screening with the DPAG. For any candidate deferral projects, SDG&E will also discuss with the DPAG the second round of screening criteria Economic/Financial and Forecast Certainty, and then finalize the candidate deferral list, as applicable.

The final candidate deferral list, if applicable, will be prioritized for viability based on the adopted characterization metrics: Cost Effectiveness, Forecast Certainty, and Market Assessment. To initiate the CSF process to procure cost-effective DER solutions, SDG&E will request authority from the Commission via a Tier 2 Advice Letter to be filed by November 15, 2021.

Distribution Resources Plans Pursuant to Public Utilities Code Section 769, at 9.

R.14-08-013 Order Instituting Rulemaking to Regarding Policies, Procedures and Rules for Development of

Decision, at OP 2.d.

### 3.1 Confidentiality of Data

This public version of SDG&E's 2021 DDOR reflects the redaction of data conforming with the "15/15 rule" criteria.<sup>4</sup> Within Appendix A, SDG&E redacts DDOR project data for two (2) planned investment projects located on circuits that are determined to be subject to the 15/15 confidentiality rule.

### 3.2 Data Access Portal

In compliance with Commission directives, SDG&E is filing its 2021 DDOR on August 16, 2021.<sup>5</sup> Corresponding with the filing of this DDOR report, applicable data from the DDOR report can be downloaded via a link within the DRP data access portal.<sup>6</sup> The data access portal will include a common layer that identifies both DDOR and Locational Net Benefit Analysis (LNBA) data for the locations described in this DDOR. Applicable 2021 DDOR and LNBA data is available within this common layer, which "pops-up" atop the circuit models in the DRP data access portal. As required by May 2020 Ruling, SDG&E is including in the DRP data access portal a sortable layer that shows planned transmission projects whose primary drivers are comparable to the four distribution services identified by the Commission for deferral by DERs.<sup>7</sup> All non-confidential data can be viewed and downloaded via Application Programing Interface (API) capabilities upon the next planned monthly data portal update<sup>8</sup>

### 4. Discussion

As part of SDG&E's distribution capacity planning process and as identified in SDG&E's 2021 GNA, SDG&E predominantly identified 13 new needs that involve only distribution peak thermal capacity and 5 new needs that involve both distribution peak thermal capacity and back-tie capacity. For purposes of SDG&E's 2021 DDOR, SDG&E uses the word "peak thermal" to represent "distribution capacity", "back-tie" to represent "reliability (back-tie)" and "microgrid" to represent "resiliency (microgrid)." As part of developing the DDOR, SDG&E analyzed each of these needs to determine appropriate mitigation projects.

The below tables show a high-level overview of the 12 new capital planned investments corresponding with the 19 needs identified in the 2021 GNA.

Table 1 summarizes the Planned Investments by project type within SDG&E's Distribution Planning Region. The Planned Investments consist of substation banks, circuits, and distribution line segment projects. A summarizing matrix is shown in Appendix A.

<sup>&</sup>lt;sup>4</sup> R.14-08-013, Administrative Law Judge's Ruling Addressing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company's Claims for Confidential Treatment and Redaction of Distribution System Planning Data Ordered by Decisions 17-09-026 and 18-02-004 (July 24, 2018).

Decision and Administrative Law Judge's Ruling Modifying the Distribution Investment Deferral Framework Process (filed 5/07/19).

SDG&E's Interactive Map & Integration Capacity Analysis is available at: <a href="https://www.sdge.com/more-information/customer-generation/enhanced-integration-capacity-analysis-ica">https://www.sdge.com/more-information/customer-generation/enhanced-integration-capacity-analysis-ica</a>.

Peak thermal, reliability ("back-tie"), voltage support and resiliency ("microgrids").

As mentioned in SDG&E's Advice Letter 3420-E filed August 12, 2019, within SDG&E's modified plan to implement a DRP data access portal, SDG&E strives to implement updates to the data access portal by the first week of each month.

<sup>&</sup>lt;sup>9</sup> See 2021 GNA, footnote 6.

|       |                        | Project Type |              | Total |
|-------|------------------------|--------------|--------------|-------|
|       | <b>Substation Bank</b> | Circuit      | Line Segment | IOlai |
| SDG&E | 0                      | 3            | 9            | 12    |

Table 1 - Summary of the Number of Planned Investments by Project Type

Table 2 summarizes the Planned Investments by Distribution Service. The majority of Planned Investments are for distribution peak thermal needs. Note that the total needs exceed the total number of projects because some projects address multiple needs.

|              | Distribution | n Service |           | Total |
|--------------|--------------|-----------|-----------|-------|
| Peak Thermal | Voltage      | Back-Tie  | Microgrid | Total |
| 18           | 1            | 5         | 0         | 24    |

Table 2 - Summary of the Number of Planned Investments by Distribution Service

Table 3 summarizes the Planned Investments by in-service date. Ten (10) Planned Investments have an in-service date within the next three years, and two (2) Planned Investments have an in-service date of 2024 or later.

|      | li   | n-Service Dat | e    |      | Total |
|------|------|---------------|------|------|-------|
| 2021 | 2022 | 2023          | 2024 | 2025 | Total |
| 0    | 10   | 0             | 0    | 2    | 12    |

Table 3 - Summary of the Number of Planned Investments by In-Service Date

Table 4 summarizes the Planned Investments by LNBA range using methodology described in Section 4.5.

| LNBA          | A Range (\$/kW-y | r)         | Total |
|---------------|------------------|------------|-------|
| \$0-100       | \$100-500        | >\$500     | Total |
| 8             | 1                | 2          | 11    |
|               |                  |            |       |
| LNBA          | Range (\$/Vpu-y  | /r)        |       |
|               | \$100,000-       |            | Total |
| \$0-\$100,000 | \$500,000        | >\$500,000 |       |
| 1             | 0                | 0          | 1     |
|               |                  |            |       |
| LNBA          | Range (\$/KWh-   | yr)        | Total |
| \$0-100       | \$100-500        | >\$500     | iotai |
| 0             | 0                | 0          | 0     |

Table 4 - Summary of the Number of Planned Investments by LNBA Range

### 4.1 DDOR Planned Investment Determination

DDOR project determination began by thoroughly reviewing needs identified in the GNA to develop the optimal solution to address those needs. This assessment began by reviewing circuit characteristics, such as phase imbalance, timing of need, available circuit ties, nearby circuits with available capacity, reactive power flow, and the relative ease with which new infrastructure could be built. SDG&E's distribution planning engineers analyze these aspects, among others, to determine a least cost, best fit and just-in-time solution to mitigate the problem.

Typically, the least cost solution to resolve identified needs is to utilize existing equipment, which can also allow for rapid implementation. These solutions include phase balancing, where load is measured and moved between the three phases to balance the utilization of the existing conductors. The practice of phase balancing is an operations function, performed on a near-term basis, and is therefore not eligible as a deferrable service. As such, forecast needs solved by phase balancing are not shown on the DDOR report. A similar solution to a need is to transfer load using existing switches or equipment. These projects are also operational in nature and have little to no associated capital investment. Because of the immediacy and low costs involved, these project types are considered to be of a *de minimis* nature and are not shown in the DDOR.

If needs cannot be appropriately mitigated using existing equipment, the option of installing new equipment is explored. New or reconductored cable or conductor, for example, can enable a load transfer or increase the capacity of the otherwise constrained asset. These projects are usually higher in cost than utilizing existing equipment due to the cost of purchasing and installing the new equipment.

Often the costliest option is to install a new circuit or substation transformer, which provides additional capacity to a larger area. These projects are often pursued in areas with significant growth and/or constraints.

### 4.2 Locational Net Benefits Analysis (LNBA)

The LNBA values were calculated using the methodology approved by the Commission and incorporated in the public version of the LNBA tool created by Energy and Environmental Economics, Inc. (E3).<sup>10</sup>

### 4.2.1 LNBA Data Sources

In the development of the LNBA tool, generic financial variables were used to approximate the deferral value for projects identified by the three utilities. Many of the factors used by SDG&E for the calculating the deferral value of DDOR projects are consistent with values already present within the LNBA tool. SDG&E updates two utility-specific variables: the Operations and Maintenance (O&M) Factor and the Book Life.

| Input                             | UG Feeder | OH Feeder | Source                                    |
|-----------------------------------|-----------|-----------|---|
| Discount Rate                     | 7%        | 7%        | Standard Assumption in E3 LNBA Calculator |
| Revenue Requirement<br>Multiplier | 1.5       | 1.5       | Standard Assumption in E3 LNBA Calculator |
| Equipment Inflation               | 2.0%      | 2.0%      | Standard Assumption in E3 LNBA Calculator |
| O&M Inflation                     | 2.0%      | 2.0%      | Standard Assumption in E3 LNBA Calculator |

E3 LNBA Tool V2.11; https://e3.sharefile.com/share/view/sb2965cf362c48399.

| O&M Factor | 1.9% | 7.4% | SDG&E Rule 2                 |
|------------|------|------|------------------------------|
| Book Life  | 30   | 30   | Book life to match SDG&E GRC |

Table 5 - LNBA Data Sources

### 4.2.2 LNBA Deferral Timeframe

One variable used when calculating the LNBA value is the deferral period. Deferral timeframes would typically depend on the type of forecast deficiency and planning horizon to calculate LNBA values. The May 2020 Ruling requires SDG&E to calculate LNBA values that assume a 10-year deferral timeframe (*i.e.*, 2021 through 2030 for this DIDF cycle).

2030 is the tenth year of this DIDF cycle; 2021 being the first year. If the need for any particular project is not identified through the tenth year, then that project's largest identified need within the 10-year timeframe will be used for purposes of calculating LNBA values for the remaining years. LNBA values begin in the first year of the need and extend through the 10-year timeframe. For example, for a need and associated project with an in-service date in year four, but no identified need beyond year five, the LNBA calculation would begin in year four and extend the year five need through year ten (2030 for this DIDF cycle). The planning horizons for different project types are shown in Table 10.

| Project Type            | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|
| Pre- and Post-          | X    |      |      |      |      |      |      |      |      |      |
| Application projects,   |      | Χ    |      |      |      |      |      |      |      |      |
| banks, circuits, & line |      |      | Х    |      |      |      |      |      |      |      |
| segments                |      |      |      |      |      |      |      |      |      |      |
| Pre- and Post-          |      |      |      | Χ    |      |      |      |      |      |      |
| Application projects,   |      |      |      |      | Х    |      |      |      |      |      |
| banks, circuits         |      |      |      |      |      |      |      |      |      |      |
|                         |      |      |      |      |      | Χ    |      |      |      |      |
| Due and Deet            |      |      |      |      |      |      | Χ    |      |      |      |
| Pre- and Post-          |      |      |      |      |      |      |      | Χ    |      |      |
| Application Projects    |      |      |      |      |      |      |      |      | Х    |      |
|                         |      |      |      |      |      |      |      |      |      | Х    |

Table 6 - Deferral Timeframes

X – Indicates potential first year of project need

Blue cells indicate the deferral period

### 4.2.3 LNBA Deficiency Need

Another variable used when calculating the LNBA value is the magnitude of the grid need deficiency. The magnitude of the grid need deficiency is deemed to be the largest forecast deficiency within the appropriate planning horizon. SDG&E uses a forecast planning horizon that is based on i) a three-year period, ii) a fixed five-year period, or iii) a fixed ten-year period, as discussed below.

### i. Fixed three-year horizon

As explained in SDG&E's 2021 GNA, SDG&E assesses the need for line segment upgrades only during the first three years of the five-year planning horizon. The first year of the deferral period for line segment needs is therefore 2021, 2022, or 2023.

Line segment needs reflect the granular allocation of DER impacts based on a system-level forecast of DER additions. Compared to needs identified for distribution circuits or substation transformer banks, where forecast DER impacts are cumulative, line segment needs are inherently uncertain and highly sensitive to individual customer decisions regarding actual DER adoption. Because individual customer adoption of DERs significantly influences line segment needs, infrastructure solutions tend to be short-term in nature. Due to the high level of forecast uncertainty associated with line segment needs that may arise beyond the third year of SDG&E's distribution planning horizon, SDG&E does not assess whether there may be line segment needs during years four and five of SDG&E's five-year planning horizon.

### ii. Fixed five-year horizon

Distribution planning engineers identify solutions within the 5-year distribution planning horizon for newly identified bank and circuit issues. Bank and circuit issues are given a fixed five-year deficiency timeframe. This method was used in the 2018, 2019 and 2020 DIDF cycles.

### iii. Fixed ten-year horizon

The May 2020 Ruling Reform 7 directed the IOUs to use a 10-year horizon for Pre- and Post-Application projects to identify deficiencies for cost-effective deferral opportunities via DERs. <sup>11</sup> SDG&E interprets this direction as requiring that the deferral period for all identified needs ends in the tenth year of the planning horizon, or year 2030.

The following illustrates the study timeframe for the different types of investments:

- Planned Investments (line segments): three-year study horizon
- Planned Investments (bank & circuit): five-year study horizon.
- Planned Investment (Pre- and Post-Application projects 12): 10-year study horizon

| Project Type         | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|----------------------|------|------|------|------|------|------|------|------|------|------|
| Planned Investments  |      |      |      |      |      |      |      |      |      |      |
| (line segments)      |      |      |      |      |      |      |      |      |      |      |
| Planned Investments  |      |      |      |      |      |      |      |      |      |      |
| (banks & circuits)   |      |      |      |      |      |      |      |      |      |      |
| Pre/Post Application |      |      |      |      |      |      |      |      |      |      |
| Projects             |      |      |      |      |      |      |      |      |      |      |

Table 7 - Planned Investment Study Timeframe

Blue cell indicates the study horizon

### 4.3 Key Operational Requirements

SDG&E's distribution system is planned and designed to support safe and reliable operation, including in emergencies. The needs addressed and services provided by the planned investments that are listed in the DDOR may include distribution peak thermal, back-tie, voltage support, or microgrid services, or a

<sup>&</sup>lt;sup>11</sup> May 2020 Ruling, Attachment A.

<sup>&</sup>lt;sup>12</sup> Pre- and Post-Application projects as defined in 2021 Grid's Needs Assessment of San Diego Gas and Electric

combination of these. The back-tie service supports unplanned (e.g., car-pole contact) and planned outages (e.g., maintenance), by providing the capacity for switching (e.g., to maintain or restore service) on a typically limited basis. Details of the back-tie service can be found in the 2019 DDOR Appendix B.<sup>13</sup> Further operational requirements for these services, including dispatch, can be found in the Technology Neutral Pro Forma (TNPF) contracts which govern DER providers' provision of distribution deferral services.<sup>14</sup>

### 4.4 Determining Candidate Deferral Opportunities

Preliminary candidate deferral opportunities are those projects that pass the technical and timing screens from the DDOR Planned Investment list. As shown in SDG&E's 2021 GNA filing, there are two (2) needs that require new capital investment in either 2024 or 2025. SDG&E will review candidate deferral opportunities with the DPAG and the Independent Professional Engineer.

Table 11 summarizes the Candidate Deferral Opportunities by Project Type.

|       | Substation<br>Bank | Circuit | Line Segment | Total |
|-------|--------------------|---------|--------------|-------|
| SDG&E | 0                  | 2       | 0            | 2     |

Table 8 - Summary of Candidate Deferral Opportunities by Project Type

Table 12 summarizes the Candidate Deferral Opportunities by Distribution Services.

|              | Distribution | n Service |           | Total |
|--------------|--------------|-----------|-----------|-------|
| Peak Thermal | Voltage      | Back-Tie  | Microgrid | Total |
| 2            | 0            | 1         | 0         | 3     |

Table 9 - Summary of the Number of Candidate Deferral Opportunities by Distribution Service

Table 13 summarizes the Candidate Deferral Opportunities by In-Service Date.

|      | lı   | n-Service Dat | е    |      | Total |
|------|------|---------------|------|------|-------|
| 2021 | 2022 | 2023          | 2024 | 2025 | Total |
| 0    | 0    | 0             | 0    | 2    | 2     |

Table 10 - Summary of the Number of Candidate Deferral Opportunities by In-Service Date

Table 14 Summarizes the Candidate Deferral Opportunities by LNBA Range using methodology described in Section 4.4.

| LNB     | LNBA Range (\$/kW-yr) |        |       |  |  |  |  |  |  |  |  |  |
|---------|-----------------------|--------|-------|--|--|--|--|--|--|--|--|--|
| \$0-100 | \$100-500             | >\$500 | Total |  |  |  |  |  |  |  |  |  |

<sup>2019</sup> Distribution Deferral Opportunity Report San Diego Gas and Electric, Appendix B

SDG&E has considered SCE's day-ahead dispatch requirement as required by reform #47 in the revised Attachment A submitted by the ALJ on June 12, 2020. SDG&E's specific dispatch requirements will be set forth in the contracts under which DER providers provide distribution services to SDG&E. These contracts are a product of the Competitive Solicitation Framework (CSF) and will be used with various modifications in the Request For Offer (RFO) solicitation process, the Standard Offer Contract pilot and the Partnership Pilot.

| 1             | 0              | 1          | 2     |
|---------------|----------------|------------|-------|
|               |                | <u> </u>   |       |
| LNBA          | Range (\$/Vpu- | /r)        |       |
|               | \$100,000-     |            | Total |
| \$0-\$100,000 | \$500,000      | >\$500,000 |       |
| 0             | 0              | 0          | 0     |
|               |                |            |       |
| LNBA          | Range (\$/KWh- | yr)        | Total |
| \$0-100       | \$100-500      | >\$500     | Total |
| 0             | 0              | 0          | 0     |

Table 11 - Summary of the Number of Candidate Deferral Opportunities by LNBA Range

### 4.4.1 Candidate Deferral Opportunities – First Screening

The application of screens to the Planned Investments list (Appendix A) results in the identification of the Candidate Deferral Opportunities. The Decision requires the application of two screens: a technical screen and a timing screen. These screens are described in the following sections.

### 4.4.2 Technical Screen

The purpose of the Technical Screen is to identify the distribution services DERs can provide to potentially defer a distribution project, and whether there are any technical deferral limitations associated with certain projects. The definitions for the key distribution services that DERs can provide were adopted by Decision 16-12-036, *Decision Addressing Competitive Solicitation Framework and Utility Regulatory Incentive Pilot*, issued December 22, 2016. 15

### 4.4.3 Timing Screen

The purpose of the Timing Screen is to ensure cost-effective DER solutions can be procured with sufficient time to fully deploy and begin commercial operation in advance of the forecast need date. Three years (by Year Four) is the earliest year considered adequate to successfully procure, contract, design, develop, market, and deploy DER solutions for these services. This was established in the DIDF stakeholder process.<sup>16</sup>

### 4.5 Candidate Deferral Opportunities - Second Screening

Once the Candidate Deferral Opportunities list is published in the DDOR Report, the DPAG will advise and assist in applying the remaining two deferral screens (*i.e.*, Economic/Financial and Forecast Certainty) to help finalize the Candidate Deferral Opportunities list. Projects that are removed from the DDOR Candidate Deferral Opportunities list will remain in the DDOR Planned Investment list but will not be considered for DER solicitation.

See, D. 16-12-036, Decision Addressing Competitive Solicitation Framework and Utility Regulatory Incentive Pilot (December 22, 2016), at Ordering Paragraph 2. The Commission adopted four key distribution services that DER can provide: distribution capacity, voltage support, reliability (back-tie), and resiliency (microgrid).

<sup>&</sup>lt;sup>16</sup> Track 3 Sub-track 3: Distribution Investment Deferral Framework Workshop, December 12, 2016.

### 4.6 DPAG Candidate Deferral Opportunities Prioritization

After initial screens have identified planned distribution projects that are feasible for deferral, the DPAG will advise on the prioritization of the Candidate Deferral Opportunities list to support the determination of which planned distribution projects should be considered for competitive solicitation. These candidate deferral opportunities will be prioritized based on the categories of Cost Effectiveness, Forecast Certainty, and Market Assessment. Pursuant to DIDF Reform #20 of the May 2020 Ruling, the IOUs collaborated on the development of a *Joint Prioritization Metric Workbook Template* for the 2021-2022 DIDF cycle. The prioritization workbook is designed to prioritize projects relatively suitable to be deferred. As required by DIDF Reform #22 of the May 2020 Ruling the *Joint Prioritization Metric Workbook Template* is attached as Appendix B with all cells unlocked.

When there are less than three candidate deferral opportunities, candidate deferral opportunities are considered Tier 1 projects unless there are "red flags" associated with a project in which case the project will be deemed Tier 3. The Commission-adopted staff proposal requires that at least one Tier 1 candidate deferral project be offered for the Partnership Pilot and at least one Tier 1 candidate deferral project be offered for the Standard Offer Contract pilot.<sup>17</sup>

### 4.6.1 Cost Effectiveness

The cost-effectiveness metric is intended to provide a relative indication of how likely DER resources can cost-effectively defer a planned investment.

- LNBA Value: The deferral value of distribution investment
- <u>Unit Cost of Traditional Mitigation (\$):</u> Cost of the traditional mitigation project designed to meet the maximum capacity need for each project.

| Criteria                 | Higher Ranking     | Lower Ranking     |
|--------------------------|--------------------|-------------------|
| LNBA value               | High LNBA value    | Low LNBA value    |
| Unit Cost of Traditional | High project costs | Low project costs |
| Mitigation (\$)          |                    |                   |

Table 12 - Cost Effectiveness Metric

### 4.6.2 Forecast Certainty

The forecast certainty metric is intended to give a relative indication of the certainty of forecast grid needs.

- <u>Grid Need Certainty:</u> The IOU-specific, maximum grid need certainty score of all the assets associated with a project.
  - <u>Weather factor adjustment</u>: Significant weather events can have a large effect on load. There is more forecast certainty in areas with less weather sensitivity.

The staff proposal for the Partnership Pilot states that "the IOUs would be required to propose at least one Tier 1 opportunity" (p. 40). The staff proposal for the Standard Offer Contract pilot states that the "IOUs would be required to launch at least one Tier 1 candidate deferral opportunity" (p. 52).

- <u>Customer-Specific Development</u>: The project need is a result of general or specific customer growth.
- <u>Historical Load</u>: Forecast load with historical measurements or anticipated growth.
- Year of Need: The earliest starting year among all assets associated with a project.

| Criteria                  | Higher Ranking               | Lower Ranking               |
|---------------------------|------------------------------|-----------------------------|
| Weather factor adjustment | Average weather factor       | Above-average weather       |
|                           | applied compared to overall  | factor applied compared to  |
|                           | system                       | overall system              |
| Customer-specific         | Numerous customer requests   | Fewer customer requests for |
| development               | for new load                 | new load                    |
| Historical load           | Forecast peak with minimal   | Forecast peak with          |
|                           | variation from recent years' | significant variation from  |
|                           | peak                         | recent years' peak          |
| Year of Need              | 2024 needs                   | 2025 needs                  |

Table 13 - Forecast Certainty Metric

### 4.6.3 Market Assessment

The Market Assessment metric is intended to give a relative indication of how likely DER resources can be sourced that will successfully meet the DER distribution service requirements.

- <u>Duration:</u> The maximum number of hours that DER is needed in a peak day, during the deferral period, to meet the need that the project mitigates
- <u>Capacity Need (MW)/Circuit:</u> The max capacity need per number of circuits to which DERs can connect and meet the grid need.
- Operational Requirement: The operational requirement of the need.
- <u>Number of Grid Needs:</u> The number of grid needs that the project mitigates.

| Criteria                    | Higher Ranking               | Lower Ranking               |
|-----------------------------|------------------------------|-----------------------------|
| Duration                    | Shorter durations            | Longer durations            |
| Capacity Need (MW)/Circuit: | Less thermal needs per       | Larger thermal needs per    |
|                             | circuit                      | circuit                     |
| Operational Requirement     | Day ahead dispatch           | Real time or Islanded       |
|                             |                              | dispatch requirements       |
| Number of Grid Needs        | Smaller number of grid needs | Larger number of grid needs |

Table 14 - Market Assessment Metric

### 4.7 Review of Project and/or Contingency Costs for prior DIDF solicited projects

SDG&E does not currently have any distribution projects undergoing solicitation for distribution services from the prior DIDF cycle(s). Therefore, no project costs or contingency costs have been identified for prior deferral projects.

### 5. Regulatory timelines and expected milestones in the DIDF process

The tentative schedule below reflects dates and milestones aligning with Commission directives pertaining to the adopted DIDF, as updated in subsequent Decisions and/or Rulings. <sup>18</sup>

| Activity  | Date  |
|---|---|
| Open First Pre-Screening Period for Potential                 | July 15 <sup>th 19</sup>                                |
| Partnership Pilot Aggregators                                 |   |
| Close First Pre-Screening Period for Potential                | August 14 <sup>th</sup>                                 |
| Partnership Pilot Aggregators                                 |   |
| GNA and DDOR published  | August 16 <sup>th</sup>                                 |
| Post Approved Aggregators from July 15 <sup>th</sup>          | September 15 <sup>th</sup>                              |
| Application Period to SDG&E Partnership                       |   |
| webpage.  |   |
| Launch RFO solicitation process and/or                        | September 15 <sup>th 21</sup>                           |
| subscription period <sup>20</sup> for Standard Offer Contract |   |
| (SOC) pilot (includes issuance of SOC price sheet)            |   |
| IPE Final Report  | October 21 <sup>st</sup>                                |
| Submit Tier 2 Advice Letter for approval to open              | November 15 <sup>th22</sup>                             |
| Partnership Pilot subscription periods                        |   |
| Open Second Pre-Screening Period for Potential                | December 15th <sup>23</sup> (assuming Advice Letter not |
| Partnership Pilot Aggregators                                 | protested)  |
| Close Second Pre-Screening Period for Potential               | January 14 <sup>th</sup> (assuming Advice Letter not    |
| Partnership Pilot Aggregators                                 | protested)  |
| Open Partnership Pilot subscription period                    | January 15 <sup>th</sup> (assuming Advice Letter not    |
|   | protested)  |
| Post Approved Aggregators from December 15 <sup>th</sup>      | February 14 <sup>th</sup> (assuming Advice Letter not   |
| Application Period to SDG&E Partnership                       | protested)  |
| webpage.  |   |
| Close Partnership Pilot subscription period                   | Earlier of when 120% of need is met or                  |
|   | contingency date reached.                               |
| Utility makes informational-only filing that                  | Following closure of the Partnership Pilot              |
| includes signed Partnership Pilot contracts.                  | subscription period. <sup>24</sup>                      |
| Contracts for Standard Offer Contract pilot                   | When pricing sheets indicate at least 90% of need       |
| tendered  | is met. <sup>25</sup>                                   |

<sup>&</sup>lt;sup>18</sup> Decision, at 69.

<sup>&</sup>quot;Will occur July 15th of each year and last 30 days." Staff proposal, Table 2 at p. 23.

<sup>&</sup>lt;sup>20</sup> "Providers then submit pricing sheets...during the subscription period." Staff proposal at p. 53.

<sup>&</sup>lt;sup>21</sup> "(Utilities) shall launch the Requests for Offers annually, on September 15. Pilot in the Requests for Offer process." D. 21-02-006, OP 11.

<sup>&</sup>quot;a final cost cap submission date of November 15 within the Tier 2 Advice Letter requesting to launch subscription periods for the Partnership Pilot." D.21-02-006, OP 2 d).

<sup>&</sup>quot;offered 30 days before each...tariff subscription launch." Staff proposal, Table 2 at p. 23.

<sup>&</sup>quot;the IOUs would file an Information-Only Submittal...with Energy Division for each planned investment that includes project descriptions, an offer and procurement outcomes summary, the executed contracts..., and any other information as required by Energy Division." Staff proposal at p. 43-44.

<sup>&</sup>lt;sup>25</sup> "When the 90% acceptance trigger is met, IOUs sign contracts with providers." Staff proposal at p. 53.

| Close subscription period for Standard Offer     | Earlier of when pricing sheets indicate 100% of |
|--|---|
| Contract   | need is met or contingency date is reached.     |
| Close RFO, aka notify the short list             | No later than January 15 <sup>th</sup>          |
| File Tier 2 Advice Letter Requesting Approval of | No later than March 15 <sup>th</sup>            |
| Contracts  |   |

Table 15 - Solicitation Schedule

### 6. Updates to the DDOR

Several narrative topics were identified as part of the May 2020 Ruling to be included within the GNA/DDOR. The following sections pertain to DER ownership models, DER integration, value-stacking, contingency solutions, energy reconciliation for bundled customers, the timing screen, and DIDF conflicts with GO 131-D.

### 6.1 Ownership models

Consistent with the DRP Pilot, any eligible DER provider – whether SDG&E or a third-party – can offer cost-effective DER solutions to defer planned distribution infrastructure projects. As referenced in the May 2020 Ruling, Reform 44: "The IOUs shall encourage bids for all forms of resource ownership (e.g., utility-owned, third-party owned, customer-owned, joint ownership) in their DIDF RFOs, allowing for bid participation and evaluation without any bias towards a specific ownership model." This sentiment aligns with SDG&E's procurement process, wherein greater participation could further benefit ratepayers.

### 6.2 Equipment to enable DER Integration

The integration equipment that enables DERs to provide services in the DIDF varies considerably by type of DER and by specific application. These requirements will be addressed by the interconnection agreement under which a DER providing distribution service interconnects with the distribution grid, and within the TNPF contract in which SDG&E and the DER provider set forth the rights and obligations of the parties to provide the contracted distribution services. Where the integration equipment is on the utility side of the meter and supports grid safety and reliability, it is not feasible for third parties to own and control the equipment. Third parties, unregulated by the Commission, cannot own and control distribution infrastructure, as they are not responsible for grid safety and reliability, and it would be impractical for them to assume the liability that would protect the utility from the financial consequences of mis-operation of utility infrastructure.

When a DER provider relies on a large number of DERs to supply the required services, SDG&E will require communication with the DERs to provide visibility into their collective operation to ensure grid reliability is not jeopardized. Ownership of these communication channels, and the point at which third-party-owned communication systems interface with the utility's communication system, will need to be determined.

In 2018, the Commission directed the IOUs to submit Grid Modernization Plans (GMP) in their next General Rate Case (GRC).<sup>26</sup> SDG&E will address needs (e.g. equipment, cost estimates, deployment

<sup>&</sup>lt;sup>26</sup> D.18-03-023 *Decision on Track 3 Policy Issues, Sub-Track 2 (Grid Modernization)* (March 22, 2018), at Ordering Paragraph 7.

approach) for broader system and longer-term DER integration. As such, the status and timing of such integration strategies is aligned with SDG&E's next GRC.

### 6.3 Value-Stacking

SDG&E supports value-stacking to potentially enhance value to consumers. SDG&E's approach includes identifying needs that DERs could cost-effectively provide, incorporating them into competitive solicitations, and allowing and encouraging participants to seek other parties (e.g. other Load Serving Entities) that may have additional needs that the DER could satisfy. This approach focuses on optimal outcomes (e.g., more competitive offers) for consumers, by linking the value-stacking opportunities to the needs and the service provider's interest (e.g., compatible with business model) and ability to deliver them (e.g., contractual obligations).

### 6.4 DERs As the First Contingency Solution

DIDF reform #49 states that "the IOUs shall identify DERs as the first contingency in their contingency planning process, and where third-party procurement is unsuccessful, shall consider full or partial IOU-ownership of a DER solution." SDG&E has already committed to considering DERs as a contingency solution in the event that the DER selected in the distribution deferral RFO fails. SDG&E previously stated in Advice Letter 3309-E that:

Should DER projects fail to deliver according to the terms of the contracts negotiated between SDG&E and the DER provider, SDG&E will evaluate potential solutions based on the timing and conditions. To the extent practical and allowed by time, SDG&E will explore alternatives to address the contingency, including DER through existing bids received. SDG&E will then pursue implementing an applicable solution to maintain safe and reliable operation. SDG&E will follow Commission approval and cost recovery processes for all costs incurred to mitigate the DER failure.

SDG&E reaffirms its commitment to considering whether DERs not selected in the RFO would be a cost-effective solution for deferring distribution infrastructure in the event the selected DER fails to perform as required by SDG&E's TNPF contract.

In the distribution planning process leading up to the publication of the GNA/DDOR, SDG&E considers whether utility-owned DERs would be a cost-effective solution for addressing identified distribution needs. SDG&E's experience has been that utility-owned DERs are often not cost-effective solutions compared to conventional distribution infrastructure additions.

Additionally, depending on when it becomes known that the DER selected in the RFO is unable to perform as required by SDG&E's TNPF contract, the time available to implement a different DER solution may or may not be adequate to meet the need date. Nevertheless, SDG&E will consider full or partial utility ownership, along with other options, to determine the most cost-effective and feasible contingency solution.

### 6.5 Timing Screen

The timing screen was developed in the DIDF stakeholder process. SDG&E is not aware of new information or advances that would suggest DERs could successfully and cost-effectively defer planned distribution infrastructure for needs in years 2021, 2022 or 2023. Key milestones include: conduct the Commission directed Request For Offer (RFO) process; finalize the terms of the TNPFC; conduct required interconnection studies and build any identified system upgrades; design, permit, construct and test solutions; and/or market to, and contract with, customers willing to participate. SDG&E continues to evaluate and recommend enhancements to the process and timeline. In the IDER proceeding, SDG&E provided recommendations for Commission consideration.<sup>27</sup> Additionally, in D.21-02-006 the Commission has directed that the utilities conduct two pilots, the Partnership Pilot and the Standard Offer Contract pilot, to see whether there are other mechanisms by which DERs can be efficiently procured to cost-effectively defer planned distribution infrastructure.

### 6.6 DIDF and GO 131-D conflicts

SDG&E believes that there can be conflicts between the DIDF and General Order 131-D which could jeopardize reliability and raise customer costs. The distribution components of a Post-Application transmission project have already undergone engineering design and review and are aligned with the transmission project need and ultimate plan of service. If the distribution components are subsequently incorporated into the DIDF, any result that differs from the plan of service included in the General Order 131-D filing would presumably necessitate an amendment. The revised plan of service may require a new, and potentially lengthy, environmental reassessment. Conducting the DIDF RFO and amending the General Order 131-D filing based on the results of the RFO will take additional time and could jeopardize the in-service date of the transmission project with attendant consequences for grid reliability. Amending the General Order 131-D filing will also add costs, including FERC jurisdictional cost, to the process.

Pre-Application projects are driven by needs at the transmission level but may have distribution components. These projects may also be affected by conflicts between the DIDF and General Order 131-D. Pre-Application transmission projects are expected to require Commission review under General Order 131-D, but an application has not yet been submitted. In many cases, substantial environmental work has been initiated and the requisite General Order 131-D filing materials are in the process of being developed. It would be disruptive to inject a DIDF RFO solicitation in the middle of developing the filing materials. Depending on the results of the RFO solicitation, new environmental work may be required and could result in changes to in-progress environmental documentation. These changes could delay the General Order 131-D filing and jeopardize the in-service date of the transmission project with attendant consequences for grid reliability and costs, including FERC jurisdictional cost. SDG&E believes the most practical way to avoid conflicts between the DIDF and General Order 131-D is to exempt from the DIDF, (i) any distribution components that are part of a General Order 131-D submittal (Post-Application projects) and (ii) any distribution components that would be part of a transmission project for which a General Order 131-D submittal at a future date is required or, in SDG&E's judgement, may

See SDG&E's February 15, 2019 response to the ALI's *Ruling Directing Submittal of Proposals for Distributed Energy Resources Tariffs*. These sourcing enhancements could streamline the RFO process.

be required (Pre-Application projects). Implementing this exemption in the DIDF process is far superior to any consideration of changing the GO 131-D process.

The existing GO 131-D process works: there is no record to support any suggestion that local agency consultation and community outreach is inadequate. Changes to GO 131-D could complicate the long-standing exempt permitting status for the construction of electric distribution line facilities (facilities operated at a voltage under 50 kV). Adding requirements to GO 131-D, which is a California Environmental Quality Act (CEQA) permitting rule, could delay customer service connections and negatively impact electric system reliability. If there are issues associated with the Distribution Planning Process and local agencies' needs, the issues should be clearly articulated, evaluated, and resolved in the new ORDER INSTITUTING RULEMAKING TO MODERNIZE THE ELECTRIC GRID FOR A HIGH DISTRIBUTED ENERGY RESOURCES FUTURE R.21-06-017 proceeding on 7/2/2021, through clear evidence and under due process.

### 6.7 Partnership Pilot

The public version of the "2021 GRID NEEDS ASSESSMENT AND DISTRIBUTION DEFERRAL OPPORTUNITY REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E)" contains a table in Appendix A labeled "DDOR – Candidate Deferrals." (page 19) SDG&E anticipates that its November 15, 2021 Advice Letter will request that the planned distribution infrastructure project identified on the table with the GNA ID "GNA\_2021\_0005" and the DDOR ID "DDOR\_2021\_0003", be approved for potential deferral by aggregators participating in the Partnership Pilot.

- a) SDG&E anticipates that the potential deferral will take place in a single one-year tranche. The amount of "Thermal" and "Back-tie" capacity that SDG&E will seek to procure through aggregator subscriptions is shown on the table for the project identified in the above paragraph, with the column heading "Capacity (MW)" for the year 2025. Note that cumulative aggregator subscriptions totaling up to 120% of the required capacity will be accepted on a first-come/first-serve basis.
- b) SDG&E anticipates that the Partnership Pilot subscription period will open on January 15, 2022. This date could change if SDG&E's Advice Letter is protested. The subscription period will close on the earlier of the contingency date specified by SDG&E in its Advice Letter or the date on which cumulative aggregator subscriptions reach 120% of the required capacity.
- c) It is anticipated that the contingency date specified in the Advice Letter will be 12 months prior to the respective project "Operating Date".
- d) Subscribed capacity must be operational by the date shown on the above-referenced table for the project described above. See the column labeled "Operating Date".

The budget design for the Partnership Pilot is as follows:

- i. Total budget: Cost Cap of  $$356,000 \times 85\% = $302,600$ . This budget is subject to change based on a more refined cost cap.
- ii. Budget for the tranche described above: Same as that specified in "i." The budget for the deployment payment is 20% of the budget for this tranche. The budget for the reservation payment is 30% of the budget for this tranche. The budget for the performance payment is 50% of the budget for this tranche.

iii. Starting one month after the opening of the subscription period, SDG&E will provide to the Energy Division a monthly update of the subscriptions received. This update will continue through 30 days prior to the next Grid Needs Assessment/Distribution Deferral Opportunity Report filing date. The next GNA/DDOR filing date is August 15, 2022, so the final update for the tranche described above will be on July 15, 2022.

# Appendix A – August 16, 2021 DDOR

## DDOR - Planned Investments

| E Prior DDOR<br>project  | z                                    | z                            | z   | z                            | z                            | z                            | z                            | z                            | z                            | z                            | z                            | z                            |  | >   | *   | *                            | >                            | >   | >                            | >                            | >                            | > :                          | - 3                          | - 3                          | - >                          | - >                          | >                            | >                            | >                            | >                      | >                      | >                            | >                                | >  | - >                                 | ->                          | . >                            | >               | >                           | >             | - >           | - >                 | >                    | >                           | >                                | >                           | >                               |                | >                           | <b>,</b>                    | >                | >                | >                | >           | > :              | - :              | ->              | ->              | >                | >                           |   |
|--|--------------------------------------|------------------------------|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--|---|---|------------------------------|------------------------------|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------|------------------------|------------------------------|----------------------------------|--|-------------------------------------|-----------------------------|--------------------------------|-----------------|-----------------------------|---------------|---------------|---------------------|----------------------|-----------------------------|----------------------------------|-----------------------------|---------------------------------|----------------|-----------------------------|-----------------------------|------------------|------------------|------------------|-------------|------------------|------------------|-----------------|-----------------|------------------|-----------------------------|---|
| Indicative AAC<br>Level  | 5                                    | s                            | 2   | 2                            | 2                            | S                            | 2                            | S                            | 2                            | 5                            | 2                            | 2                            |  | s   | S   | 2                            | S                            | 2   | S                            | 5                            | 5                            | 5                            | 0                            | 0 1                          | n v                          | 2                            | n w                          | , ,                          | v                            | 0 10                   | 10                     |                              | 1                                | ,  |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             |   |
| Customer Count Indicative AACE Prior DDOI (Industrial) Level project | 9                                    | 0                            | 0   | 0                            | 0                            | 0                            | 0                            | 0                            | 0                            | 14                           | 0                            | 1                            |  | 2   | 0   | 2                            | ю                            | 17  | 6                            | 0                            | 0                            | 2                            | -                            | 0                            | 0 0                          |                              | 0 0                          | 0 0                          | c                            | 0                      | 0                      | C                            | -                                | •  |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             |   |
| Count  | 82                                   | 454                          | 366   | 19                           | 0                            | 305                          | 6                            | 110                          | 140                          | 58                           | 6                            | 4                            |  | 159   | 7   | 520                          | 227                          | 971   | 1765                         | 12                           | 96                           | 97                           | 132                          | 55                           | 5.4                          | 5 2                          | 47                           | 63                           | 69                           | 2 2                    | 0                      | 2                            | 465                              |  |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             |   |
| Count  | 4                                    | 2373                         | 2925  | 1314                         | 2                            | 2493                         | 409                          | 2479                         | 1986                         | 2557                         | 528                          | 482                          |  | 1299  | 0   | 2006                         | 2                            | 7313  | 17014                        | 393                          | 87                           | 507                          | 600                          | 389                          | 400                          | 1306                         | 1330                         | 493                          | 288                          | 218                    | 119                    | C                            | 2385                             | 000                                      |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             |   |
| Estimated LNBA<br>(\$/Kwh-yr)  |                                      |                              |   |                              |                              |                              |                              |                              |                              |                              |                              |                              |  |   |   | ,                            |                              |   |                              |                              |                              |                              |                              |                              |                              |                              |                              |                              | SS74 00                      | 2014:00                |                        |                              | \$111.00                         | 200                                      |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             |   |
| Estimated LNBA Estimated LNBA (\$/Vpu-yr)                            |                                      |                              |   |                              |                              |                              | \$75,519.04                  |                              |                              |                              |                              |                              |  |   |   | ,                            |                              |   |                              | I                            |                              |                              |                              |                              |                              |                              |                              | \$1 246 21                   |                              |                        |                        |                              |                                  |  |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             | Ī                           |                  |                  |                  |             | Ī                |                  | Ī               |                 |                  |                             |   |
| Estimated LNBA E<br>Range (5/KW-year)                                |                                      | \$32.94                      | \$622.71                                    | \$55.65                      |                              | \$3.34                       |                              | \$194.92                     | \$7.22                       | \$548.02                     | \$30.00                      | \$29.75                      |  |   | \$75.36                                     | \$15.77                      | \$20.93                      | \$75.36                                     | \$10.31                      |                              | \$736.05                     | \$2.02                       | \$104.55                     | 51,784.54                    | \$102.87                     | \$113.73                     | \$115.72                     | 10:10                        |                              |                        |                        |                              |                                  | \$0.5100                                 | 6100-6500                           | \$100-\$300                 | 6100.6500                      | \$0.5100        | \$0-\$100                   | \$0.5100      | 50-5100       | \$100,\$500         | \$100-\$500          | \$0-\$100                   | >\$500                           | \$0-\$100                   | TBD                             | 2              | \$0.\$100                   | \$0.5100                    | \$100-\$500      | \$0-\$100        | \$0-\$100        | \$100-\$500 | \$0.5100         | 50-5100          | \$0-\$100       | \$100-5500      | \$0-\$100        | \$0-\$100                   |   |
| DER Service<br>Eligibile R:  |                                      | Yes                          | Yes   |                              |                              |                              |                              |                              |                              |                              |                              |                              |  |   |   |                              |                              |   | 14                           |                              |                              |                              |                              |                              |                              |                              | 4                            |                              |                              |                        |                        |                              |                                  |  |                                     | - 197                       |                                |                 |                             |               | 12            |                     |                      |                             |                                  |                             |                                 |                | 100                         |                             |                  |                  |                  |             |                  |                  |                 |                 |                  | Yes                         |   |
| Distribution Service   | Thermal, Backtie                     | Thermal                      | Thermal, Backtie                            | Thermal                      | Thermal                      | Thermal, Backtie             | Voltage                      | Thermal, Backtie             | Thermal, Backtie             | Thermal                      | Thermal                      | Thermal                      |  | Thermal, Backtie                            | Thermal, Backtie                            | Thermal                      | Thermal, Backtie             | Thermal, Backtie                            | Thermal                      | Voltage                      | Thermal, Backtie             | Thermal, Backtie             | Thermal, Backtie             | Thermal, Backtie             | Thormal                      | Thermal Backtia              | Thermal Backtie              | Voltage                      | Reciliency (Microarid)       | Resiliency (Microgrid) | Resiliency (Microgrid) | Resiliency (Microgrid)       | Resiliency (Microarid)           | Thermal Backtie                          | Thermal Backtie                     | Thormal                     | Thermal Backtie                | Thermal Racktie | Thermal Backtie             | Thermal       | Thermal       | Thormal             | Thermal Backtie      | Thermal, Backtie            | Thermal, Backtie                 | Thermal, Backtie            | Thermal, Backtie                | and an arrange | Thermal, Backtie            | Thermal, Backtie            | Thermal, Backtie | Thermal, Backtie | Thermal, Backtie |             | Thermal, Backtie | Inermal, Backtie | Thormal Backtie | Thermal Backtie | Thermal, Backtie | Thermal, Backtie            |   |
|  | MW                                   | MW                           | MW  | WW                           | MW                           | MW                           | Npu                          | MW                           | MW                           | WW                           | MW                           | MW                           |  | Amps  | Amps  | Amps                         | Amps                         | MW  | MW                           | Npu                          | Amps                         | Amps                         | Amps                         | Amps                         | Ampe                         | Ampe                         | Amne                         | Voii                         |                              | H                      |                        | l                            |                                  |  | Amne                                | Amps                        | Ampe                           | Ampe            | Amps                        | Amne          | Amne          | Amps                | Amps                 | Amps                        | Amps                             | Amps                        | WW                              |                | Amps                        | Amps                        | Amps             | Amps             | Amps             | Amps        | Amps             | Amps             | Amps            | Amps            | Amps             | Amps                        |   |
| eficiency Eq.  | ı                                    | 2%                           | 0.42%                                       | 32%                          |                              | %8                           | 0.04%                        | 5%                           | 3%                           | 1%                           | 13%                          | 1%                           |  |   | 2%  | 7%                           | 12%                          | 8.7%  | 4%                           |                              | %9                           | 2%                           | 10%                          | 136                          | 19%                          | 30%                          | 20%                          | 1%                           | 100%                         | 1000                   |                        |                              |                                  | 17%                                      | 3367                                | 6370                        | 13%                            | 4%              | 4%                          | 1%            | 36%           | 200                 | %5                   | 32.8%                       | 2.0%                             | 0.3%                        | 4.6%                            | 200            | 9.3%                        | 15.7%                       | 10.6%            | 19.2%            | 15.6%            | 21.5%       | 9.5%             | 20.0%            | 2 300           | 13 5%           | 17.7%            | 0.33%                       |   |
| eficiency D  | ı                                    | 98.0                         | 50.0  | 1.21                         |                              | 0.85                         | 00.0                         | 0.21                         | 0.27                         | 0.04                         | 0.35                         | 0.02                         |  |   | 12  | 43                           | 73                           | 90.5  | 2.3                          | ı                            | 7                            | 52                           | 2,                           | 1                            | 2 2                          | 43                           | 10                           | 0,                           | 2000                         | 2000                   |                        |                              | 17000                            | 85                                       | 3 5                                 | 1/                          | 71                             | 33              | 24                          |               | 15            | q                   | 26                   | 164                         | 11                               | 2                           | 138                             |                | 95                          | 94                          | 19               | 52               | 28               | 58          | 12               | 77               | t 0             | 13              | 23               | 2                           |   |
| In-Service Deficiency Deficiency Equipment                           | 6/1/2022                             | 5/1/2025                     | 6/1/2025                                    | 6/1/2022                     | 6/1/2022                     | 6/1/2022                     | 6/1/2022                     | 6/1/2022                     | 6/1/2022                     | 6/1/2022                     | 6/1/2022                     | 5/1/2022                     |  | 5/1/2021                                    | 5/1/2021                                    | 6/1/2021                     | 5/1/2021                     | 6/1/2021                                    | 6/1/2021                     | 6/1/2021                     | 6/1/2021                     | 6/1/2021                     | 5/1/2021                     | 6/1/2021                     | 1707/1/0                     | 6/1/2021                     | 6/1/2021                     | 6/1/2021                     | 1/1/2021                     | 5/1/2021               | 5/1/2021               | 9/30/2020                    |                                  | H  | 6/1/2020                            | 0202/1/0                    | 6/1/2020                       | 6/1/2020        | 6/1/2020                    | 6/1/2020      | 6/1/2020      | 6/1/2020            | 6/1/2020             | 6/1/2019                    | 6/1/2019                         | 6/1/2019                    | 6/1/2020                        | 20000          | 6/1/2019                    | 6/1/2019                    | 6/1/2019         | 6/1/2019         | 6/1/2019         | 6/1/2019    | 6/1/2019         | 6/1/2019         | 6/1/2019        | 6/1/2019        | 6/1/2019         | 6/1/2022                    |   |
| Additional Ir  | 9                                    | 9                            | 9   | 9                            | 9                            | 9                            | 9                            | 9                            | 9                            | 9                            | 9                            | 9                            |  | 9   | 9   | 9                            | 9                            | 9   | 9                            | 9                            | 9                            | 9                            | 0                            | 0                            | 0 4                          | 9                            | 0 40                         | 9                            | 7                            |                        | S                      | 6                            | 7                                |  | 9                                   | 0 1                         |                                | 9 42            | 9                           | 9 42          | 9             | 0 4                 | 9                    | 9                           | 9                                | 9                           | Cost 6                          | -,             | 9                           | 9                           | 9                | 9                | 9                | 9           | 9                | 0                | 0 4             | 0 4             | 9                | 9                           |   |
| Equipment Involved Info  | Trenching, Conductor, Sectionalizing | Sectionalizing, Capacitors   | Trenching, Cable, Capacitor, Sectionalizing | Conductor                    | Conductor                    | Conductor                    | Voltage Regulator            | Conductor                    | Cable                        | Conductor                    | Cable                        | Conductor                    |  | Trenching, cable, capacitor, sectionalizing | Trenching, cable, capacitor, sectionalizing | Cable, Sectionalizing        | Sectionalizing, Capacitor    | Trenching, cable, capacitor, sectionalizing | Cable                        | Capacitor                    | Conductor                    | Cable                        | Conductor, cable             | Conductor                    | Conductor                    | Cable Cartionalising         | Cable, Sectionalizing        | Capacitor                    | Solar Battery Storage        | Solar Battery Storage  | Solar, Battery Storage | Rattery storage              | Hydrogen storage battery storage | Trenchine cable canacitor sectionalizing | Tranship cable captured, secondaria | Tranching cable capacitor   | Tranchine cable sectionalising | Cable           | Cable                       | Canacitor     | Capacitor     | Conductor Capacitor | Conductor, Capacitor | Cable                       | Trenching, cable, sectionalizing | Fuse Cabinet, cable         | Substation transformer bank est |                | Conductor, cable            | Sectionalizing, cable       | Conductor        | Conductor        | Conductor        | Conductor   | Conductor        | Cable            | Conductor       | Conductor       | Conductor        | Sectionalizing, cable       |   |
| Description  | New Circuit                          | Transfer with new equipment  | New Circuit                                 | Reconductor                  | Reconductor                  | Reconductor                  | New Voltage Regulator        | Reconductor                  | Reconductor                  | Reconductor                  | Reconductor                  | Reconductor                  |  | New Circuit                                 | New Circuit                                 | Transfer with new equipment  | Transfer with new equipment  | New Circuit                                 | Transfer with new equipment  | New Capacitor                | Reconductor                  | Reconductor                  | Reconductor                  | Reconductor                  | Reconductor                  | Baconductor                  | Recorductor                  | New Capacitor                | Mirrogrid                    | Microgrid              | Microgrid              | Mirrogrid                    | Mirroarid                        | New Circuit                              | Manu Circuit                        | Transfer with new equipment | Now Circuit                    | Recordictor     | Transfer with new equipment | Now Conscitor | New Capacitor | Recorductor         | Reconductor          | Transfer with new equipment | New Circuit                      | Transfer with new equipment | New Transformer                 |                | Transfer with new equipment | Transfer with new equipment | Reconductor      | Reconductor      | Reconductor      | Reconductor | Reconductor      | Reconductor      | Reconductor     | Recorductor     | Reconductor      | Transfer with new equipment |   |
| Bank /<br>Circuit  | 536                                  | 1202                         | 832   | 730                          | 356                          | 95                           | 396                          | 450                          | 1094                         | 277                          | 437                          | 701                          |  | 272   | 744   | 139                          | 555                          | GE3233                                      | NCW3031                      | 186                          | 470                          | 382                          | 493                          | 336                          | 707                          | 401                          | 1130                         | 1081                         | 448                          | 221                    | 221                    | 677                          | RR3031                           | C105                                     | C376                                | 0110                        | 080                            | (34)            | 6020                        | (300          | Ces           | C463                | C303                 | C757                        | C166                             | C183                        | B30                             | 3              | C209                        | C1094                       | C237             | C77              | C414             | C205        | C702             | 583              | C303            | 233             | C759             | 890                         |   |
| Substation   | Border                               | San Ysidro                   | North City West                             | Spring Valley                | Alpine                       | Jamacha                      | Santee                       | Ash                          | San Marcos                   | Clairemont                   | Scripps                      | Mission                      |  | GENESEE                                     | GENESEE                                     | VINE                         | EL CAJON                     | GENESEE                                     | ST                           | ESCONDIDO                    | FELICITA                     | ELLIOT                       | NWOLDE                       | ALPINE                       | IAMACHA                      | MIIDDAY                      | SANTEE                       | DEI MAR                      | CAMFRON                      | SANTA YSABEL           | SANTA YSABEL           | CRFFIMAN                     | RORREGO                          | Old Town                                 | Coronado                            | Coronado<br>Station R       | Carlton Hills                  | Santee          | Melrose                     | Dandlaton     | Dal Mar       | San Veidro          | Cannon               | Batiquitos                  | Chollas West                     | Escondido                   | Jamacha                         |                | Melrose                     | San Marcos                  | Creelman         | El Cajon         | Granite          | Melrose     | Mission          | Murray           | Kancho Santa Fe | Spring Valley   | Spring Valley    | Del Mar                     |   |
| Facility ID  | 2021 0209                            | 2021_0279                    |   | 2021_0982                    | 2021_0984                    | 2021_0985                    | 2021_0986                    | 2021_0987                    | 2021_0988                    | 2021_0989                    | 2021_0990                    | 2021_0991                    | DDOR filings   | 2020_0042                                   | 2020 0047                                   | 2020 0198                    | 2020_0403                    | 2020_0831                                   |                              | 2020 0978                    | 2020 0979                    | 2020 0978                    | 5050 0707                    | 2020 0983                    |                              | 2020 0006                    | 2020 0982                    | 2020 0988                    | 2020 0989                    | 2020 0990              | 2020 0991              | 2020 0992                    | 2020 0993                        | 2019 0134                                | 2010 0102                           | 2019 0218                   | 2019 0376                      | 2019 0464       | 2019 0521                   | 2019 0554     | 2019 0076     | 2019 0972           | 2019 0978            |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             | black and redacts   |
| DDOR ID  | DDOR 2021 0001                       | DOR 2021 0002                | DOR 2021 0003                               | DOR 2021 0004                | 3000 2021 0005               | 3DOR_2021_0006               | JDOR 2021 0007               | 3DOR 2021 0008               | DOR 2021 0009                | DOR 2021 0010                | DOR 2021 0011                | DOR 2021 0012                | Data below is taken directly from prior DDOR filings | DOR_2020_0001                               | DOOR 2020 0001                              | DOR 2020 0002                | DOR 2020 0003                | DOOR 2020 0001                              | DOR 2020 0004                | 3000 2020 0005               | DOOR 2020 0006               | 2000 2020 0007               | 2020 0008 2000 0008          | 2020 0009<br>2020 0009       | DOOR 2020 0010               | 2020 0012                    | DOOR 2020 0012               | DOR 2020 0014                | 2000 000 BOOK                | DDOR 2020 0016         | 100 2020 0017          | NOOR 2020 0018               | PDOR 2020 0019                   | 200 000                                  |                                     |                             |                                |                 |                             |               |               |                     |                      |                             |                                  |                             |                                 |                |                             |                             |                  |                  |                  |             |                  |                  |                 |                 |                  |                             | Confidential information is highlighted in black and redacted |
| GNAID  | GNA 2021 0001 D                      | GNA_2021_0002_DDOR_2021_0002 | GNA 2021 0005 DDOR 2021 0003                | GNA 2021 0008 DDOR 2021 0004 | GNA_2021_0010 DDOR_2021_0005 | GNA 2021 0011 DDOR 2021 0006 | GNA 2021 0012 DDOR 2021 0007 | GNA 2021 0013 DDOR 2021 0008 | GNA_2021_0014 DDOR_2021_0009 | GNA_2021_0015 DDOR_2021_0010 | GNA_2021_0016 DDOR_2021_0011 | GNA_2021_0017 DDOR_2021_0012 | Data below is taker                                  | GNA_2020_0001 DDOR_2020_0001                | GNA 2020 0002 DDOR 2020 0001                | GNA 2020 0003 DDOR 2020 0002 | GNA 2020 0004 DDOR 2020 0003 | GNA_2020_0006 DDOR_2020_0001                | GNA_2020_0009 DDOR_2020_0004 | GNA_2020_0010 DDOR_2020_0005 | GNA 2020 0011 DDOR 2020 0006 | GNA 2020 0012 DDOR 2020 0007 | GNA_ZUZU_UUI3 DUUR ZUZU_UUU8 | GNA 2020 0015 DDOR 2020 0009 | GNA 2020 0015 DDOR 2020 0010 | GNA 2020 DOTE DOOR 2020 DOLS | GNA 2020 0019 DDOR 2020 0013 | GNA 2020 0020 DDOR 2020 0014 | GNA 2020 0021 DDOR 2020 0015 | GNA 2020 0022 D        |                        | GNA 2020 0024 DDOR 2020 0018 | GNA 2020 0025 DDOR 2020 0019     | 200                                      |                                     |                             |                                |                 |                             |               |               |                     |                      | 2018 0002                   | 2018 0006                        | 2018_0007                   | 2018 0008                       |                | 2018_0009                   | 2018_0011                   | 2018 0018        | 2018_0020        | 2018_0022        | 2018 0024   | 2018 0026        | 2018 0027        | 2018 0030       | 2018 0035       | 2018 0036        | 2018 0038                   | Confidential informa  |

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# DDOR – Candidate Deferrals

| rear   | 2021                                   | 2022    | 2023    | 2024    | 2025           | 2026           | 2027           | 2028           | 2029           | 2030         | 2021                                   | 2022             | 2023             | 2024             | 2025           | 2026           | 2027           | 2028           | 2029           | 2030         | 2025              | 2026              | 2027              | 2028              | 2029              | 2030              |
|--|--|---------|---------|---------|----------------|----------------|----------------|----------------|----------------|--------------|--|------------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Yearly Frequency Year  |  |         |         |         | 62             | 95             | 95             | 95             | 95             | 92           |  |                  |                  |                  | 30             | 30             | 30             | 30             | 30             | 30           | 1                 | 1                 | 1                 | 1                 | 1                 | 1                 |
| Time of Year   |  |         |         |         | June - October | June-October |  |                  |                  |                  | June - October | June-October | January- December |
| uration  |  |         |         |         | 6              | 11             | 11             | 11             | 11             | 10           |  |                  |                  |                  | 3              | 3              | 3              | 3              | 4              | 9            | 2 J               | 2 J               | 2 J               | 2 J               | 2 J               | 2 J               |
| Hour of Day Duration   |  |         |         |         | 14-22          | 13-23          | 13-23          | 13-23          | 13-23          | 14-23        |  |                  |                  |                  | 18-20          | 18-20          | 18-20          | 18-20          | 18-21          | 18-23        | 0 - 23            | 0 - 23            | 0 - 23            | 0 - 23            | 0 - 23            | 0 - 23            |
| Energy Need<br>(MWh)   |  |         |         |         | 7.74           | 16.03          | 17.35          | 16.65          | 15.95          | 13.88        |  |                  |                  |                  | 0.16           | 0.46           | 0.71           | 0.97           | 1.65           | 3.05         | 0.10              | 0.31              | 0.48              | 0.65              | 0.83              | 1.02              |
| Capacity<br>(MW)   |  |         |         |         | 98'0           | 1.46           | 1.58           | 1.51           | 1.45           | 1.39         |  |                  |                  |                  | 90.0           | 0.15           | 0.24           | 0.32           | 0.41           | 0.51         | 0.05              | 0.15              | 0.24              | 0.32              | 0.41              | 0.51              |
| Distribution Service Required  | Thermal                                | Thermal | Thermal | Thermal | Thermal        | Thermal        | Thermal        | Thermal        | Thermal        | Thermal      | Thermal, Backtie                       | Thermal, Backtie | Thermal, Backtie | Thermal, Backtie | Thermal        | Thermal        | Thermal        | Thermal        | Thermal        | Thermal      | Back-tie          | Back-tie          | Back-tie          | Back-tie          | Back-tie          | Back-tie          |
| LNBA Value Contingency Plan  | \$32.94                                |         |         |         |                |                |                |                |                |              | \$622.71                               |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| Jnit Cost of Traditional LN Mitigation (\$1000s)   |  |         |         |         |                |                |                |                |                |              | \$3,831                                |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| Operating Date   | 6/1/2025                               |         |         |         |                |                |                |                |                |              | 6/1/2025                               |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| Circuit  | 1202                                   |         |         |         |                |                |                |                |                |              | 832                                    |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| Facility ID Tier Substation/Subtransmission line Circuit Operating Date Mitigation (\$1000s)   (\$1/8/W-Yr)   (\$1/8/W-Yr) | San Ysidro                             |         |         |         |                |                |                |                |                |              | North City West                        |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| ID Tier  | 1 62                                   |         |         |         |                |                |                |                |                |              | 333 1                                  |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| Facility   | 2021_02                                |         |         |         |                |                |                |                |                |              | 2021_05                                |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| DDOR ID  | DDOR_2021_0002                         |         |         |         |                |                |                |                |                |              | DDOR_2021_0003                         |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |
| GNA ID   | GNA_2021_0002 DDOR_2021_0002 2021_0279 |         |         |         |                |                |                |                |                |              | GNA_2021_0005 DDOR_2021_0003 2021_0533 |                  |                  |                  |                |                |                |                |                |              |                   |                   |                   |                   |                   |                   |

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# Appendix B – August 16, 2021 Prioritization Metrics Workbook

DDOR - LNBA Data

Refer to "2021 DDOR Prioritization Metrics.xlsx" tabs "LNBA General Inputs", "LNBA Project Inputs", and "LNBA Backend Results"

DDOR - Prioritization Metrics Data

Refer to "2021 DDOR Prioritization Metrics.xlsx" tabs "Introduction" and "Prioritization Metrics Template".

Revised 9/24/2021